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Hospital Funding within the Health Care System: Moving Towards Effectiveness

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EXECUTIVE SUMMARY

Hospitals play a major role within the health care system. Because of the large and growing costs of institutional care, funding of the hospital sector and of individual hospitals within it is becoming an increasingly important policy issue. To be successful, any hospital funding strategy must be congruent with objectives for the health care system and must embody incentives which move hospitals and the system towards those objectives.

The fundamental goal of the health care system is the improvement or maintenance of the health status of the population. To achieve this, the system must deliver effective services - services that have been shown to maintain or improve health outcomes. Each of these services must be provided in the most technically efficient manner - at the lowest possible cost. Finally, there must be a careful balance of services produced in order to achieve systemic efficiency - production of the volume and mix of services that optimize health outcomes for a given level of resource expenditure. Hospitals must have a well defined role, and the services they provide must be limited to those for which they are best suited. To do this, information must be available on both the costs of health services and the health outcomes which flow from them.

The objectives of a publicly funded health care system imply a number of criteria for evaluating different funding strategies. These criteria can be summarized under the categories of effectiveness, efficiency, equity and practicability. Five funding strategies have been examined in relation to these criteria. Two of these, global funding and case payment, are mechanisms for funding individual hospitals. Strictly speaking, the other three - managed care capitation, geographically based capitation and health care

envelopes - are not 'hospital' funding strategies. Instead they address the relative volume and mix of hospital services to be provided within the range of health care services. Each provides a different way of considering the relative allocation of funding to the hospital sector within the larger health care system. They may be used as funding mechanisms *per se* or alternatively as management tools that give direction to the process by which funding decisions are made.

Global budgeting and case payment have been used extensively to fund hospitals. The former is the predominant method in Canada, while the latter is used for funding Medicare in the United States. Each system has certain strengths. Global budgeting allows for a capping of expenditures by fixing the size of the allocation to individual hospitals. As a result of its widespread use in Canada, hospital costs are lower in Canada than in the USA. Case payment funding, on the other hand, allows for a much finer examination of hospital activities and expenditures. Because it breaks hospital activities into specific diagnosis-related cases and tracks expenditures on that basis, it allows for a comparison of treatment costs for similar cases across different hospitals. A case payment approach therefore assists in identifying the relative efficiency of different institutions.

In general, these hospital funding schemes are subject to three fundamental problems which seem to be inextricably linked:

1. They attempt to limit the supply of services without controlling the demand.

2. They focus on technical efficiency (providing a given service at the lowest cost), but do not provide incentives for evaluating health outcomes, and so do not deal with effectiveness or cost-effectiveness.

3. They fund individual hospitals (and hence the hospital sector) in isolation from the rest of the health care system.

Given these shortcomings, there is a need to take a broader view of hospital funding in order to address these issues. The three approaches that deal with funding of the hospital sector within the health care system address the issues in different ways.

Managed care capitation, as practised in health maintenance organizations (HMOs) in the USA and health service organizations (HSOs) in Canada, concentrates the responsibility for the total health care of an individual within a single organization. Incentives are created to limit the demand for services by physicians within the organizations. To a lesser extent the organizations provide incentives to look at issues of effectiveness. However there are significant impediments and uncertainties associated with implementing them on a population wide basis in Manitoba.

Geographically based capitation provides a broader view of health care funding by allocating funds to regions on a per capita basis. Used as a funding scheme, regional authorities would have responsibility for allocating funds to (or buying services from) specific health care providers. Given the size and distribution of the population and existing facilities within Manitoba, it is not at all clear that any net gains in effectiveness, efficiency or equity could be accomplished by replacing global budgeting by this funding mechanism. Nonetheless, the perspective gained from using per capita analysis on a geographic basis represents an important management tool to guide the hospital funding process.

Funding health care via an 'envelope' system, in which a dollar amount would be allocated to a broad health care area (such as cancer, or

cardiovascular care) is a strategy that has not been widely discussed or implemented. This strategy contains incentives which would lead health care providers to place more emphasis on effectiveness. It would also facilitate transfers of funds between the hospital sector and other sectors of the health care system. Both of these effects could help to move the system in the direction of systemic efficiency. However, given the unavailability of good information about hospital expenditures in relevant health care areas (such as cancer or cardiovascular care), the introduction of envelopes as a funding strategy at this time would involve a substantial reliance on arbitrary decision making. This would be likely to lead to a loss of stakeholder support for the process. An envelope funding strategy would also introduce significant risks by opening new avenues of consumer pressure and demand. For instance, discussion of the exact number of dollars dedicated to specific health care areas such as cancer and heart disease would facilitate the mobilization of powerful interest groups and reduce funders' ability to limit funding in specific health care areas. When considered as a management tool instead of a funding strategy, an envelope approach is likely to have less demanding information requirements and therefore to be more feasible. It would offer a useful perspective to guide decision making about the hospital funding process. However, even as a management tool, an envelope approach would require a significant commitment to the development of new information.

A reorientation of health care funding must begin to correct shortcomings of the existing funding systems. Effectiveness must provide the focus for achieving better and more systemically efficient results. Only if "outcomes" and "effectiveness" become part of the vocabulary used by funders, policy makers, health care providers, the media, and the public can inappropriate demand be limited. Only when the costs of specific services are known with some degree of accuracy can care be provided in the most cost-effective fashion. Hospital and health care funding can be rationalized only when an understanding of these concepts becomes embedded in the culture of

health care provision.

This will not be an easy task. There are great technical difficulties associated with measuring costs, health outcomes and hence, cost-effectiveness. Developing a language of outcomes will first require major investments in developing meaningful indicators. Indicators of effectiveness and efficiency will then have to be introduced gradually and carefully into the decision-making process. This will certainly require refinement of the indicators and encouragement of relevant stakeholders to participate in the process. This represents a time and resource intensive process. It is a task that will be controversial and imperfect in its initial stages. But it is important that the first steps be taken. Manitoba is uniquely situated to be a leader in this area inasmuch as the claims data base furnishes a platform for the construction of outcome and hence effectiveness measures.

At the first stages crude indicators such as age- and sex-adjusted mortality and morbidity, adverse sequelae of procedures, and use of resources subsequent to hospital care may have to serve as proxies for more precise measures of hospital outcome. Indicators of activity costs such as length of stay, paid hours per patient day, etc. may have to serve as surrogates for direct cost data. Despite the limitations of measures such as these, some starting point is required. Acknowledgement of the need for a start, acceptance of the ultimate goal, and involvement of stakeholders at an appropriate stage should allow for the incremental refinement of hospital outcome and effectiveness measurements.

Global funding is an established formula which has brought a measure of stability to the system. To date it has been used primarily as a tool for controlling expenditure levels. It has not been used to manage the system - to reallocate resources either across hospitals or within hospitals. Several of the strategies reviewed in the paper could be used to strengthen and refine

this process. Tools from case payment systems could be used to provide information about efficiency and, when combined with outcomes information, about effectiveness of specific institutions and the hospital sector. Perspective gained from using per capita utilization analysis should be used as a management tool to guide funding decisions. The envelope funding perspective can be used to help redirect discussions about hospital funding towards outcomes and thus begin to address the issues of effectiveness and inappropriate demand.

The fundamental conclusion that flows from this analysis is that the global system should be maintained in the interim as the base for hospital funding, but that it should be redirected so that concepts of effectiveness play a more central role in funding decisions. Perspectives and tools from case payment, per capita and envelope approaches should be used to guide the decision making process. Specifically, it is recommended that:

- A major investment should be made in developing hospital data that will provide useful information on effectiveness and cost-effectiveness. Given the centrality of information about both costs and outcomes in any strategy to move to more cost-effective delivery of health care services, a number of specific initiatives are recommended:

    * A feasibility study should be conducted using Manitoba hospital data to test the utility of currently available case classification methods (including CMGs, DRGs, and refined DRGs) as a basis for assessing intermediate hospital products and providing useful information to global funding negotiations.

    * A pilot should be conducted, if possible, to determine the utility of case mix classification methods in conjunction with methods to estimate hospital costs as a basis for assessing the technical

efficiency of inpatient care in Manitoba hospitals.

  * A feasibility study should be conducted using Manitoba hospital data to test the utility of easily constructed indicators of outcomes in assessing the performance of hospitals. These might include case mix and severity adjusted mortality, readmissions, and other adverse sequelae.

  * The participation of health care providers should be sought in modifying indicators of case mix, technical efficiency and outcome that flow from the prior recommendations.

- Given some baseline of effectiveness and costing information, an envelope system should be piloted as a management tool.

- Regional per capita utilization should be used to provide information to inform global funding decisions.

Given the novelty of the concepts underlying the general approach discussed above, it may be necessary to introduce the concepts of effectiveness, cost-effectiveness and systemic efficiency into funding discussions via several initiatives that are not directly relevant to hospital funding processes. These initiatives should also have the effect of generating data that may be useful in the subsequent implementation of an effectiveness oriented strategy. They may also result in modifying the behaviour of some health care providers by furnishing them with relevant information. To these ends it is recommended that:

- Protocols to evaluate new interventions, procedures and technologies in

terms of outcome should be developed and implemented.

- New interventions, procedures and technologies should be not be funded unless they are found to be effective and cost-effective in relation to alternative approaches.

- The College of Physicians and Surgeons should be supported and encouraged to initiate work on the development of effective practice guidelines where evidence exists and to develop methods to monitor practice patterns. In particular:

    * A more comprehensive pattern of practice reporting format should be developed for newly licensed physicians, and should be mandatorily applied for the first five years of practice, on a pilot basis. Data should be gathered, aggregated, analyzed and distributed on indicators such as hospitalization rates, diagnostic test utilization, referrals, and outcomes. Feedback to individual physicians should allow them to evaluate their practice in relation to norms that may be generated from a representative sample of physicians in the Province.

    * The format of the physician practice profile should be revised and updated to make it more user friendly and to initiate introduction of indicators of outcome and effectiveness that are meaningful to clinicians (in light of the experience with the preceding recommendation). The College should encourage physicians to become familiar with their own patterns of practice in relation to their peers.

1. INTRODUCTION

The terms of reference for this project called for an overview of existing and potential methods of hospital funding. Five approaches were specified for examination: global funding, case payment, managed care capitation, geographically based capitation, and a newly conceived alternative - health care envelopes. The study was to identify strengths and weaknesses of each of these modalities and, in light of that analysis, provide guidance on possible directions for hospital funding in the Province of Manitoba. Consideration was to be given to issues associated with the possible implementation of alternative approaches and what additional information would be required before a decision to proceed could be made.

According to the terms of reference, funding was defined in a narrow sense to mean the funding of operating costs. While there is clearly a link between capital and operating costs, for the purposes of simplicity in this analysis, emphasis was placed on funding of operating costs. The analysis was restricted to consideration of acute care; funding for chronic care, long term care and personal care homes was specifically excluded from the analysis. Accordingly, the term hospital funding in this document will be used to refer to the funding of operating costs for acute, short stay institutions and for the hospital sector comprised of these institutions.

2. METHODS

Two avenues of inquiry were followed in preparing this report. The first consisted of a review of the literature on hospital funding, the second involved interviews with officials of the Manitoba Health Services Commission who had responsibility for implementing and monitoring funding for health care institutions in the Province. It was determined at the outset of the study in the terms of reference that primary data collection and direct consultation with officials in the hospital sector would not be pursued. The report consists of a synthesis of the findings from the literature review, along with a theoretical and practical analysis of the issues of hospital funding. One of the main preliminary findings was the conclusion that a movement towards effective and efficient health care required consideration of more than the hospital sector alone. As a result, consideration has been given to the entire health care system and the particular role of the hospital sector within it.

Two major streams of documents were reviewed. The first was the academic health care literature and the second was a set of working documents and reports from the provinces and selected areas in the United States. The main areas of academic literature surveyed were analytic and historical writings on health care funding in general, and hospital funding in particular. The working papers and reports reviewed consisted of a wide variety of committee and working group reports on various aspects of health care funding in the provinces and a few other locations. In all, a broad spectrum of viewpoints and suggestions was surveyed.

The report does not attempt to furnish a representative sampling of all views but rather attempts to provide a synthesis of the experience embodied in

the documents as filtered through a coherent vision of the health care system. Consequently, it was not deemed appropriate to make extensive explicit reference to specific works. However, a full listing of documents consulted is provided in Appendix A. Similarly, the discussions with MHSC officials provided background information on perceived problems with, and capabilities of, existing systems at the Commission. Insight from those interviews inform the analysis; the list of officials consulted is contained in Appendix B.

3. OBJECTIVES OF THE HEALTH CARE SYSTEM

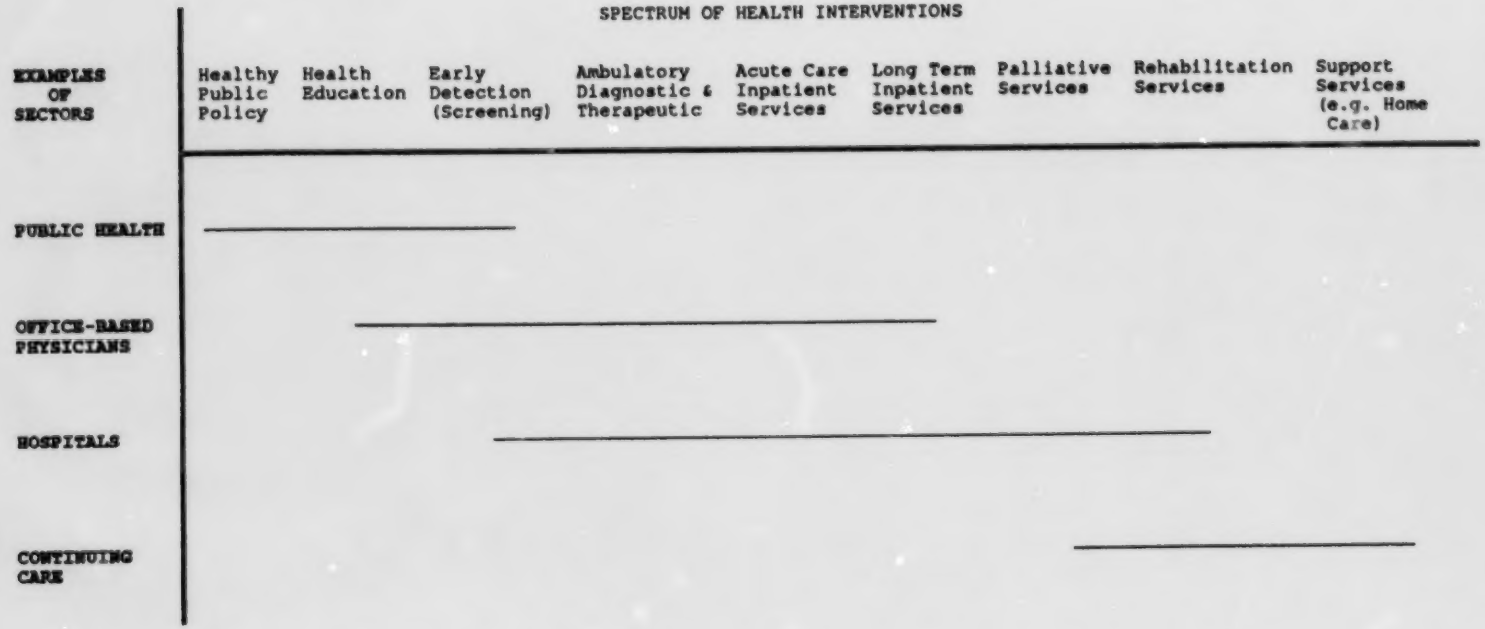
The funding of hospitals takes place within a health care system which spans activities from preventive through rehabilitative and palliative interventions. Within the system, hospitals represent one sector of service delivery that itself provides a range of interventions (Figure 1). Physicians' offices, nursing homes, continuing care and public health represent others. Because hospitals are positioned within a larger framework of services and programs, it is important to study problems of hospital funding with a clear understanding of the role of hospitals within that system. To do this, it is instructive to specify both the broad objectives of a publicly funded health care system and the specific goals of the hospital sector within that system. These are briefly outlined below.

3.1 The Fundamental Objective: Improving Health Status

The fundamental objective of a health care system is to improve or maintain the health status of the population. This relatively simple goal is complicated by difficulties of defining, describing and measuring health, and also by variations in the health status of different segments of the population. Traditionally, population health has been assessed with measures of mortality, morbidity and other indicators of negative health. Increasingly it is recognized that health must be understood in more positive terms, and that the concept must be broadened to include aspects of quality of life. However, since measurement of health remains hampered by our available tools, morbidity and mortality remain central and must be included in any measures of health status. Considerations of equitable provision of services and achieving equity in health status across the population further complicate the

FIGURE 1

ROLES OF VARIOUS SECTORS WITHIN THE HEALTH CARE SYSTEM



specification of objectives.

3.2 Production and Delivery of Effective Services

To achieve its fundamental objective, a publicly funded health care system must deliver interventions that work. This implies that individual interventions produce positive health outcomes (benefits), or at least that they do more good than harm. But ideally the system should do more - it should provide interventions that work **best**. The system should deliver the services which produce the most desirable outcome for each individual's condition.

In principle it is easy to see that providing the most effective intervention is an integral component of a strategy to maximize health status. In practice, however, there are three impediments to achieving that goal. These obstacles relate to informational problems, resource limitations and incompatible incentives.

The first barrier is presented by an information requirement. Information on the effectiveness of all interventions for any given health problem must be available if one is to know and use the most appropriate service. This requirement is hampered both by limitations in our methods for measuring and comparing health outcomes as well as by the paucity of research that evaluates effectiveness. As Frederick Robbins, Past President of the Institute of Medicine, National Academy of Sciences of the United States noted (1985), it is "dismaying to realize ... that many of the things that we do in medical care have never been satisfactorily documented as effective. If we are to develop a health care system that is as effective as possible, we will have to develop better methods than exist now to assess and monitor the range of medical care on a range of health problems".

The second impediment is the limitation of available resources. It is simply financially impossible to provide all possibly beneficial services to each person in a society. The problem of costly and minimally beneficial expenditures is illustrated by former medical protocols that called for six iterations of Guaiac stool tests to detect cancer. Clinical research has shown that the sixth iteration has a marginal cost of roughly $47 million for every additional case found. This raises the question of whether spending $47 million to detect a case of cancer represents a wise societal investment. At some point, marginal increases in health status gains simply are not worth the added expense.

The third obstacle is posed by conflicting incentives: funding and remuneration systems often contain incentives which mitigate against the use of the most effective treatment and instead encourage provision of ineffective treatments. Most of them do not incorporate an understanding of effectiveness.

In practice, therefore, the delivery of effective services must be conducted within a resource constraint, under conditions of imperfect information, and within the context of funding approaches which do not reward provision of effective services. Any health care system must make provision for dealing with these impediments if it is to achieve its fundamental goal of improving health status. Funding services that are not effective or are less effective represents a waste of resources that would be better spent on the provision of services that are effective. Routine funding of services without a requirement that they be rigorously evaluated makes it likely that resources are being wasted in this manner. Indeed, one might argue that in a publicly funded system with limited resources, a burden of proof should exist to demonstrate that a service does work at an adequate level of performance before it becomes one of the system's 'offerings'.

3.3 Technical Efficiency in the Production and Delivery of Services

Given the scarcity of resources, any system - public or private - should attempt to produce and deliver any given service in a manner that requires a minimum of resource requirements. This is a matter partially separable from the question of delivering the most effective service. Once a service has been mandated, it can be provided in many ways. It is an instrumental goal of any health care system that the chosen service be provided in the least costly fashion. Doing so makes the maximum possible resources available for the delivery of additional services.

3.4 Systemic Efficiency in Production and Delivery of Services

Attaining the two previous objectives - choosing the most effective service for a given condition, and providing that service in the most technically efficient fashion - does not guarantee an optimally functioning health care system. In order to achieve this, the system must provide the volume and mix of services which, for any given level of resource expenditure, maximize the health status of the population. This can be achieved by the provision of services which are most cost-effective. Doing this requires that all services produced and delivered by all components of the health care system are priorized in terms of the health outcomes that they produce per dollar expended to produce them. To achieve efficiency across the system, services should be priorized so that the most cost-effective volume and mix are produced for any given level of expenditure. This implies that less cost-effective services are not provided. Furthermore, across the health care system, the last dollar spent in any sector should yield gains in health outcomes equivalent to those of other sectors. If that is achieved the system as a whole becomes efficient. This feature will be referred to as systemic efficiency.

Again, this requirement is easy to state in principle, but extraordinarily difficult to achieve operationally. The impediments are in this case the unavailability of information on relative cost-effectiveness of services, shortcomings of methods to measure outcomes in a comparative manner, and the absence of mechanisms for rationalizing the volume and mix of services to be produced by the system.

3.5 The Equitable Provision of Health

It is well known that health status of the population is intimately connected to socio-economic factors. As a consequence, different subgroups of the population experience different levels of health. One of the goals of a democratic health care system is to provide a reasonably equitable level of health across these subgroups. There are two means of accomplishing this: one is to address the underlying economic and social differences and the other is to deal with existing pathologies which afflict a disadvantaged subpopulation. Discussion of the former is beyond the scope of the current project. Consideration of the latter brings into sharp relief some of the inherent conflicts between equity and other objectives.

Suppose that it would be very costly to raise the health status of some group within the population to that of the population average. Further suppose that overall morbidity and mortality could be reduced more in the advantaged portion of the population by the use of those funds. A strict and narrow cost-effectiveness approach would dictate spending the money on those who could benefit most, despite the fact that the disadvantaged would be disadvantaged even further. Consideration of equity would lead to a different conclusion. A cost-effectiveness approach is also likely to suggest that some individuals, because they have diseases for which treatment is costly and not likely to be beneficial, should not receive treatment. From an equity

perspective, it is likely to be argued that everyone is entitled to some minimal level of treatment. Ultimately, these issues turn on questions of value, and not on rigid consideration of cost-effectiveness. The responsibility for choosing which allocations are to be made are ultimately societal decisions that, in a democratic society, are vested in elected representatives.

3.6 The Specific Role of the Hospital Sector

The institutions that provide hospital care constitute a separate sector within the overall health care system. Their objectives, while compatible with those of the system as a whole, are specific to their role. While their major focus is inpatient care, their range of activities is much broader, encompassing health education, screening services, ambulatory care, palliative care and rehabilitative services. Within this range, their particular function is the delivery of interventions which require continuous contact with a patient and which may require complex diagnostic and therapeutic services, specialized expertise and access to expensive technology. For those interventions, the hospital sector and individual hospitals must have as a major objective the delivery of the specific interventions that improve or maintain the health status of the population in the most effective and efficient fashion. Thus approaches to hospital funding must facilitate not only effective and efficient service delivery within the hospital sector, but also must encourage identification of which services are best provided within the hospital sector and which are best provided by other sectors of the health care system. To do this, information on both the costs and the outcomes associated with different interventions must be available and must influence funding decisions.

3.7 Summary

Several objectives are central to publicly funded health care systems. Fundamentally, the health care system aims at improving or maintaining the health status of the population, including quality of life. In order to achieve this goal, the system must deliver effective services - that is, services that have individually been demonstrated to work to improve health outcomes. Furthermore, these services must be produced and delivered in a manner that is technically efficient - that is, with a minimum of resource requirements. There must be a concern for the volume and mix of different types of services. The mix of effective services must be balanced to achieve the maximal impact on health status for any given resource expenditure. Were that to be accomplished, the system would be doing the best possible job of attaining its goals within its constraints. Finally, the system must take into account concerns for equity, despite the fact that this may, at times, conflict with systemic efficiency. But if all of this is to be done, information must be available on costs and outcomes.

4. PROBLEMS WITH HOSPITAL FUNDING

4.1 A Framework for Understanding Hospital Funding

Before beginning to consider the problems of hospital funding, it is useful to establish a framework for understanding the manner in which hospitals function: how hospitals use resources to produce outcomes.

The resources used by hospitals can be referred to as 'inputs'. The principle input to hospital care is labour, but non-labour inputs such as food, fuel, drugs, equipment, etc. also represent important resource requirements for hospitals. Inputs vary in terms of price, volume and mix.

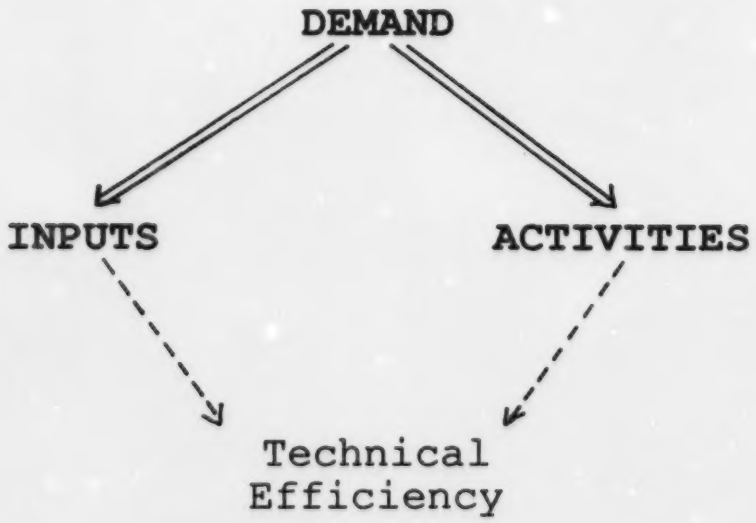
Inputs produce 'activities' which include admissions, specific procedures, outpatient visits, and others. Traditionally, hospital function has been understood in terms of the relationship between inputs and activities: activities (or services) have been considered the major output of hospitals (Figure 2).

This model has had major implications for how we think about hospitals. The efficiency of hospitals has been understood in terms of the relationship between inputs and activities, or technical efficiency (e.g. operating costs per day, paid nursing hours per admission, etc.). Consequently, hospital funding has tended to focus on limiting the price, volume and mix of inputs used to produce given activities in order that technical efficiency be maximized.

A perspective which focuses on the need to improve health status forces a rather different and deeper understanding of hospital function. It suggests

FIGURE 2

TRADITIONAL PERSPECTIVE ON HOSPITAL FUNDING



that we should view it primarily in terms of the link between hospital activities and 'outcomes'. Hospital activities in this context become only intermediate products of hospital function. Hospital inputs produce intermediate hospital activities, which in turn, produce the health outcomes that are the most important products of hospital care (Figure 3). Efficiency and effectiveness must then be understood in terms of their relationship to inputs, activities and outcomes within the context of this framework.

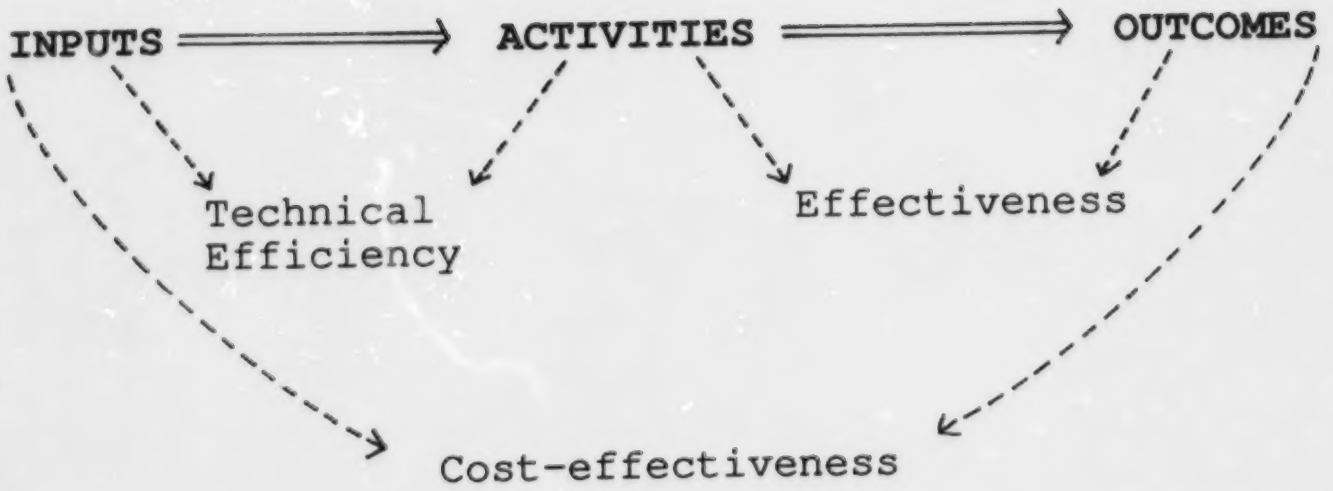
Effectiveness (Does it work?) is determined by the nature of the relationship between activities and outcomes. If a given activity produces a beneficial health outcome when applied to a patient, then it is effective. If an alternative activity produces a better outcome, it is more effective. Hospitals must strive to produce effective services.

Technical efficiency is determined by the relationship between inputs and activities. A given activity can be provided in different ways, using different volumes, mixes and prices of inputs. The lower the cost of the inputs required to provide a given activity, the more efficient the mode of delivery. Hospitals must also strive to be technically efficient in the delivery of activities.

Cost-effectiveness refers to assessment of a given activity in terms of the level of improvement in health outcome it generates in relation to the cost of the inputs required to provide the activity. The ratio of the cost of the inputs for a given activity to the measure of health outcome produced is an indicator of its cost-effectiveness. Hospitals, like all real world institutions, operate under resource constraints. Thus some activities which have minimally beneficial outcomes cannot be provided because they are not as cost-effective as others: their provision would preclude an ability to provide other activities which produce better outcomes for a given cost. By choosing the most cost-effective activities hospitals can in principle improve systemic

FIGURE 3

"OUTCOMES" PERSPECTIVE ON HOSPITAL FUNDING



efficiency both within their own institution and within the hospital sector as a whole.

Of course, what is simple to state in principle is extremely difficult to accomplish in fact. Several complicating factors must be considered in a meaningful calculation of efficiency, effectiveness and cost-effectiveness. The first is the specific type of health problem(s) addressed. For instance, treatment of a severe heart attack requires a different set of inputs and activities than does treatment of a severe pneumonia - and is likely to have a different outcome. Measures of effectiveness, technical efficiency, and cost-effectiveness of treating these two conditions will yield very different figures. Consequently, hospitals that have a higher proportion of admissions for severe heart attacks will fare differently in terms of these indicators than hospitals that have a higher proportion of admissions for severe pneumonia. The particular composition of health problems by a hospital is referred to as its **case-mix**. This feature must be incorporated into analyses of effectiveness and efficiency in order to make them meaningful. The second factor is the level of severity of the health problems addressed. As an example, treatment of a simple pneumonia requires a much lower level of inputs and activities than does treatment of a severe pneumonia - and is likely to have a better outcome. Consequently, measures of effectiveness and efficiency must also adjust for the level of **severity** in order to make comparisons across institutions meaningful. Other factors that have been argued to confound the nature of these relationships include: the size of the hospital (larger hospitals may achieve economies of scale), the location of the hospital (relevant for the price of inputs) and the amount of teaching conducted in the hospital (which affects volume and mix of inputs).

To date, effectiveness issues have not been addressed by hospital funding strategies. Traditional approaches have tended to focus only on inputs - the extreme left of Figure 3. Constraints on supply have been used

as a rough device for trying to force efficiency. More recently, initiatives such as Diagnostic Related Group (DRG) funding in the U.S. which pays a fixed price per admission have shifted the focus from the funding of inputs toward the funding of activities. The framework in Figure 3, which suggests that the real product of hospital function is health outcomes, suggests that funding strategies should shift the focus even further, from one of funding inputs to funding activities and ultimately toward one of funding based on outcomes and effectiveness. For this to happen, outcome assessment and evaluation of the effectiveness of activities produced by hospitals must become an operative element in the equation and must, in turn, influence the demand for hospital activities (Figure 4).

Existing strategies for funding hospitals are therefore inadequate as a means of dealing with the overall strategic issue of the systemically efficient provision of health care because their focus has been too narrow. They have generally concentrated on:

1. controlling the supply of inputs without taking measures to ensure that the demand by both patients and physicians for services is constrained,

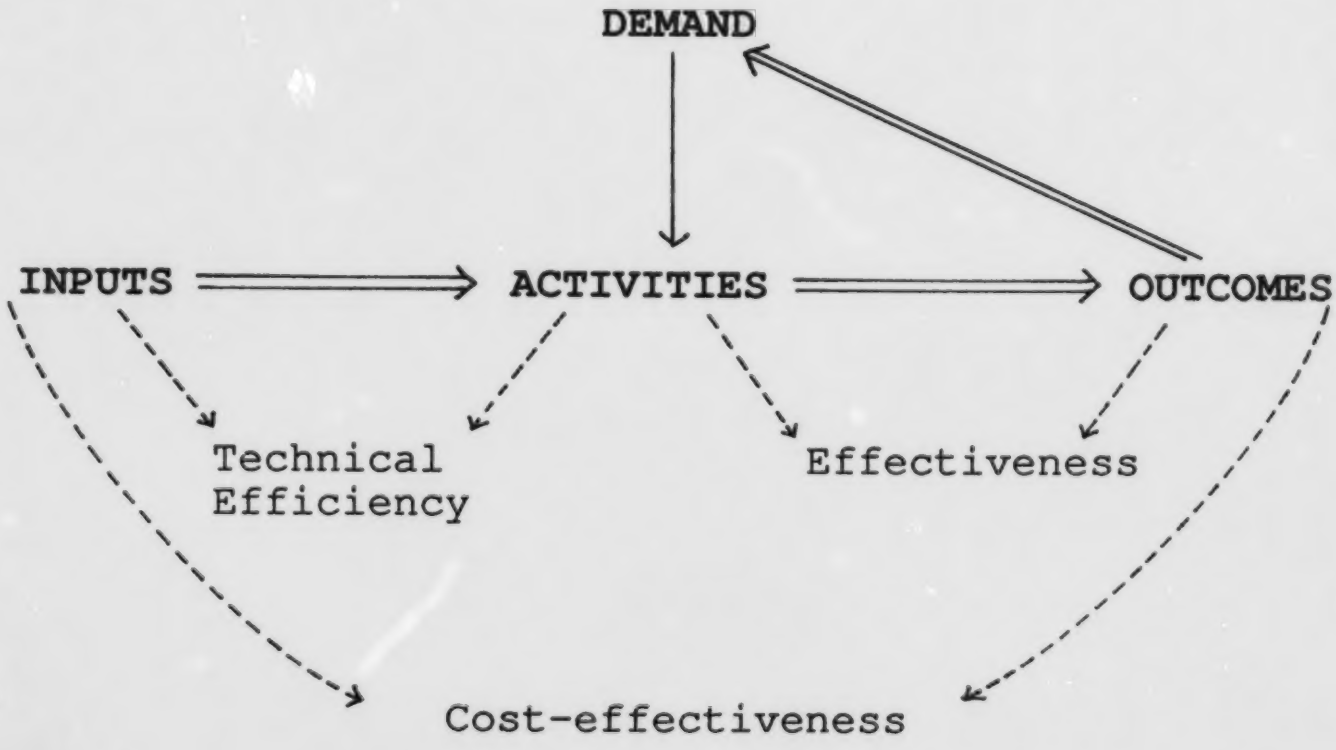
2. controlling inputs or activities without taking steps to assess outcomes, effectiveness and cost-effectiveness,

3. funding the hospital sector without a means of rationalizing service delivery across the sectors.

These attributes are intimately linked, and taken together, they place inexorable pressure on the funder. Demand tends to rise and in the absence of information on outcomes, there is no way of arguing for reallocation of funds from potentially high cost/low effectiveness activities to those that are more

FIGURE 4

MODERATION OF DEMAND IN "OUTCOMES" PERSPECTIVE



cost-effective. In an environment in which inputs for the delivery of services show a long-term trend of cost increases greater than the overall inflation index, the problem is exacerbated. If overall systemic efficiency is to be achieved, it is important that these problems and their interrelationships be understood and addressed in any funding strategy.

4.2 The Problem of Funding Limited Supply without Controlling Demand

Attempting to fund a given level of supply of hospital based services without careful attention to the factors generating demands on the system has led to a relentless build up in pressure for more and more hospital services. The main forces within the health care system which generate demand for services can be identified:

1. Physicians play a pivotal gatekeeping role in the system. Significant differences in patterns of practice as regards admissions exist. Increasing physician numbers create increasing demand for admissions.

2. The population is aging and is increasingly being medicalized.

3. New and costly technologies and interventions are being developed at an escalating pace.

4. Supply creates its own demand - the availability of resources and services creates pressure for their use.

4.2.1 Admissions, Physician Discretion, and Patterns of Practice

Hospitals were created, in large measure, for physicians (Oakes 1990). As procedures became more technologically sophisticated, technical efficiency demands led to a centralization of services: it made sense to pool all of a given doctor's patients in one place. Similarly, it was reasonable to cluster all those needing a particularly complex treatment. Hospitals provided that locus. Physician requests for hospital space to deliver services continues to be one of the fundamental elements of demand faced by hospitals.

One issue of continuing concern is the possibility that significant numbers of admissions are inappropriate. From a narrow point of view, an admission would be inappropriate if a less expensive alternative to hospitalization could produce a similar or better outcome. From a systemic point of view it would be inappropriate if a greater health gain could be made for a different person by the use of the funds consumed in the admission. The problem of inappropriate admissions goes beyond the obvious issue of lowering the costs of gains in health status. Some diagnostic procedures, treatments, and other features of hospitalization actually lead to health status losses. Thus, tracing the causes of inappropriate admissions, and tailoring a funding regime to minimize them, is one way of moving towards systemic efficiency and healthier outcomes.

Payne (1987) presents a review of studies dealing with inappropriate hospital utilization. She notes three factors that might explain inappropriate admissions: 1) the patient and family (or support system), 2) the physician, and/or 3) the hospital. She concludes that the bulk of inappropriate admissions can be attributed to the physician or hospital, with the most powerful explanatory factor being variation in individual physician practices. Two types of evidence buttress this conclusion. First, evaluations of changes in physician admitting rates in response to feedback

show that inappropriate admissions can be reduced by individual doctors. Moreover, variation in hospital utilization rates across jurisdictions suggests variations in physician styles as a contributing factor. For example, Wennberg (1982) has demonstrated in comparative studies of New Haven and Boston that significant variation in per capita costs can be attributed to differences in admission rates.

The rates of inappropriate admissions are certainly not negligible. Citing eight recent studies in the USA Payne (1987) notes that percentages of inappropriate admissions were found to range from 6% to 40%, with a mean of 16.5%. Similarly, Siu et al. (1986) found variations in inappropriate admissions across six sites from 10% to 35%. In fact, Roos et al. (1986) argue that admission and readmission rates are the strongest determinants of the total days consumed per capita. As more physicians enter practice the importance of their role increases. Given these findings, it is imperative that the potential effect of any funding strategy on admission rates be well understood and that the funding of health care be designed to discourage inappropriate admissions.

4.2.2 Medicalization of an Aging Population

Another factor has been placing an increased demand on hospital facilities. The population has been aging. However, the problem does not appear to be simply one of increasing numbers of older people:

> The proportion of Canada's health care services utilized by patients aged 65 and over has been rising rapidly over the past two decades. ... But the impact of aging per se on health care utilization has been consistently shown to be quite small ... (I)f the elderly are creating a health care cost crisis, it is through increased relative servicing

rather than their increasing relative numbers. (Hertzman et al. 1990 p. 819).

Patterns of servicing the elderly have undergone rapid change over time. For instance, analysis of change in patterns of service delivery for coronary heart disease demonstrates that the elderly are receiving increasing volumes of ever more complex interventions at ever older ages over time. Another cause of this increased usage, especially among aging women, is due to the 'medicalization' of other nonmedical problems. When, for example, an elderly widow suffers depression, with attendant appetite and weight loss from living alone on a low income, the treatment might well be an inappropriate intervention such as hospitalization. A third pattern relates to levels of service before death - the bulk of intense medical utilization and expenditures for the elderly are incurred in the final year of life.

The improvements in health status that are gained from these patterns of servicing the elderly remain unevaluated in terms of effectiveness or cost-effectiveness. Because they place very large pressures upon demand for hospital resources, any funding strategy will have to address the issue of how well these patterns of servicing work to improve health status. Specifically: 1) are more complex and costly patterns of servicing the elderly for conditions such as coronary heart disease effective? 2) are there better ways of dealing with the social and economic problems of the aged than via medical interventions? and 3) are the interventions taken in the period just prior to death appropriate, given available alternatives?

4.2.3 Changing Complexity of Technology and Interventions

All of the factors noted above mediate demands within the hospital sector. But one environmental factor impinges upon all of them and upon

hospitals directly. Medical technology, for both diagnosis and treatment, is developing at an ever increasing rate. Much of it is extremely expensive to buy and to operate. New developments are widely publicized and vigorously promoted by their developers. Physicians and hospitals try to provide the best possible service and in so doing, they show an inherent faith in, and bias towards, technological solutions. Coupled with patient demand, there is overwhelming pressure to use the latest (and generally most costly) technologies. Given the realities of the democratic process, the political system usually responds affirmatively to that demand which, in turn, raises the price, volume and mix of inputs to produce hospital activities.

Deber and Leatt (1986) document the relentless pressures and accession to those pressures by the Ontario system in the case of CT scanners. The results they describe are characteristic: a policy designed to limit expensive new technologies (to efficient levels) is eroded by a competitive desire on the part of health care providers, coupled with a lack of political will by funders. One needs an environment which insists upon demonstrated effectiveness and cost-effectiveness of new technologies before adoption and further requires operational protocols for the use of those technologies, if one is to limit the continuing and mounting pressure on the system. Any approach to hospital funding ignores, at its peril, the increased demands for expenditures stemming from new technologies - some evaluative procedure must be an integral component of funding decisions.

4.2.4 Demand Created by Supply: Beds Per Capita

Although physician discretion and style of practice have been noted as factors affecting admission rates, a structural characteristic of the health delivery system, the availability of more beds per capita, clearly allows for higher levels of hospitalization and results in higher per capita expenditure.

Wennberg's 1982 comparative study indicated that Boston had 795 more beds than would have been required had New Haven practices been followed, thereby incurring annual expenditures of $300 million ($US) more than was required. Boston arguably had enough hospital beds for a population twice the city's size (Wennberg 1990). The recent Report of the Brandon General Hospital Peer Review Committee (1989), while finding that a seasonal closing of beds was not a practice to be recommended, noted an interesting effect of bed unavailability. "The waiting list actually declined during the period of (67 bed) closures". Nor was there any substantive evidence that the closures increased patient morbidity. As Bunker and Schaffarznick (1986) note:

> The decision to hospitalize a patient, especially for medical conditions, is strongly affected by the number of beds per capita. For historical reasons that seem to have little to do with patient needs, the number of hospital beds per 1000 population in the United States shows great variation as does the closely related number of hospital employees and the consequent per capita expenditures for hospitalization. When a community possesses more beds, those beds are used for a variety of medical conditions that in less bedded areas are more often treated in an ambulatory setting... p. 398

Clearly, differences in the availability of beds per capita must be taken into account in any funding formula which aims at achieving healthy outcomes at reasonable cost.

4.3 The Absence of Measures of Health Outcome

The traditional assumption built into funding formulae is that all demands are symptomatic of underlying needs in the population and that responding to those demands will yield significant gains in health outcomes

for the population. Increasingly, it is becoming apparent that all demands are not necessarily of this sort. Many pressures for increased services are founded upon hopes and conjectures that particular diagnostic techniques or treatments will have significant impacts upon individual and population health. But those expectations may not be grounded on solid data. Funders and health care deliverers must be able to distinguish those demands which promise to improve health status from those which do not. To do this they must have access to reliable information on the health outcomes that follow from various interventions. A fundamental problem with current hospital funding is that data of this nature are not routinely available and do not play a role in the allocation of funds.

This lack of a role for outcomes in the funding formulae, coupled with the persistence of demands for new services has often led to a narrowing of focus by funders. In order to free up funds to meet new demands, emphasis has been placed on increasing the technical efficiency of service delivery: it is assumed that if existing services could only be provided more efficiently, at lower cost, perhaps there might be enough resources freed up to meet more of the new demand. The primary lever of funders has been either inputs into hospital care or intermediate products. Questions such as: "How many people in various categories are being employed to provide how many days of care?" and "How can the activities or outputs be increased without additional funding?" have tended to dominate funding debates.

Increasing the technical efficiency of service delivery is certainly desirable and can yield some returns. However, it provides no way of determining whether all of the existing services are effective or even necessary. To put it simply: no amount of concentration on the efficient delivery of an ineffective and unnecessary service can ever make it effective. Interventions which are ineffective for some set of conditions or subset of the population should not be offered in those situations - all the money saved

should be allocated to more cost-effective interventions. Concentrating on technical efficiency will result in some efficiency savings but it will leave inappropriate interventions in place. To achieve the full gains possible there must be a reorientation of focus. Health care providers and funders must begin to concentrate on effectiveness: the use of the most appropriate intervention for a given condition. And to do this, measures of the outcomes associated with different diagnostic and treatment procedures are required. No current system has the capability of systematically dealing with funding on the basis of outcomes. And failing that, there is no way to rule out some demands as not worthy of support because they are likely to yield unacceptably low levels of health gains.

It may be important to have outcomes used as a basis for eliminating currently inappropriate services. But it is also important that they play a role in evaluating newly proposed diagnostic and treatment techniques. Only if incentives can be produced that will encourage the public, physicians, and hospital administrators to assess their demands for services in light of evidence of effectiveness can progress be made in reducing inappropriate demand. And as noted above, inappropriate demand is a key factor in driving up costs and reducing systemic efficiency.

In the United States, a major initiative of Congress has highlighted the emerging importance of a focus on outcomes. In 1989 it established the Agency for Health Care Policy and Research which has responsibility for implementing the Medical Treatment Effectiveness Program. The major goal of this program is to improve the effectiveness and appropriateness of medical practice by developing and disseminating scientific information regarding the effects of presently used health care services and procedures on patients' survival, health status, functional capacity and quality of life.

Without adequate outcome information, carefully considered judgements on

the appropriate levels of funding for various interventions and institutions cannot be made. The current system does not even provide incentives for the collection of outcome information, which might in the short term lead to improvement of methods for measuring outcomes, and in the long term provide guidance to funding on the basis of effectiveness. Information on outcomes is only going to be used by practitioners if it can be made to impact on their basic concerns. Initiating a process of tying funding to outcomes, effectiveness and cost-effectiveness would certainly sensitize hospital administrators to the need to monitor the effects of procedures. They, in turn, would have incentives to feed back that information to the physicians who have the responsibility for prescribing treatment; this might well influence physicians' practice patterns. Thus by beginning the process and rewarding more cost-effective centres, demand might well be created for the information needed to manage care more explicitly on an outcomes basis. Currently, the absence of an outcomes perspective precludes this form of management.

4.4 Funding the Hospital Sector in Isolation

There are a variety of service delivery options available within the health care system (through personal care homes, community clinics, home care etc.) that provide alternatives to hospital care, as outlined in Figure 1. Accumulated evidence suggests that alternative services are sometimes both more effective and less costly than institutional care. Yet funding of the hospital sector is usually considered in isolation from funding of other components of the health care system. If appropriate reallocations are to be made across sectors in order to achieve systemic efficiency, funding arrangements must begin to be designed with the whole system in mind. Funding which considers different sectors in isolation is hampered in that regard. The failure to use outcome measures in funding hospitals precludes shifting

delivery to the most cost-effective sectors of service provision in the health care system.

4.5 Summary

The three problems identified above seem to be intimately linked. Demand for particular kinds of services cannot be damped unless an environment is developed in which treatment and funding decisions are based on information about the effectiveness of interventions. In the absence of an approach to funding that encompasses the entire spectrum of health care activities, funding decisions cannot be made which encourage the delivery of the most effective and cost-effective services in the most technically efficient manner. Existing approaches to funding do little to address these problems, but they may offer clues as to how one might proceed to make progress.

5. CRITERIA FOR EVALUATING HOSPITAL FUNDING STRATEGIES

In evaluating alternative approaches to hospital funding, it is useful to identify a set of criteria against which they can be measured. These criteria fall into two general areas. First and foremost, any strategy for funding hospitals must be capable of reinforcing and strengthening the overall objectives of the health care system and of hospitals within that system. The second set of criteria relates to the practicability of a funding strategy within the realities of the political and administrative environment. Thus a strategy must be feasible and practical. Some of the major criteria to be considered are outlined below under headings which relate to overall goals and practicability.

5.1 Effectiveness, Efficiency, and Equity

A fundamental reality underlying any attempt to affect behaviour of stakeholders in the health care system is that they are subject to the same general behavioral laws that influence the economy as a whole. If a funding strategy is to achieve its goals it must embody incentives which move the stakeholders to actions consistent with its goals. In economic terms it must be 'incentive compatible'. Thus:

- It should provide incentives to encourage hospitals and the hospital sector to produce and deliver effective services and it should not reward production and delivery of ineffective services.

- To promote production and delivery of effective services it should provide incentives to encourage hospitals and the hospital sector to

focus on health outcomes, while taking into account case-mix and severity.

- It should provide incentives for hospitals and the hospital sector to achieve technical efficiency in the production and delivery of effective services.

- It should promote systemic efficiency of the health care system as a whole by providing incentives to ensure that the volume and mix of services provided by hospitals and other sectors maximize benefits in terms of health outcomes. This attempt to adjust the balance and mix of services should occur at three levels: 1) at the level of the individual hospital to ensure that services produced and delivered are the most effective and cost-effective forms of care; 2) at the level of the hospital sector to rebalance the set of services produced and delivered by particular hospitals and types of hospital (e.g. reduction of duplication of services); and 3) at the level of the health care system to adjust the balance of the hospital sector with respect to other sectors (e.g. substitution of cost-effective alternatives to institutional care).

- It should provide levers to reduce demand from the public and from physicians for inappropriate hospital services - that is, those that are not effective, cost-effective or consistent with systemic efficiency.

- It should promote equity of health outcomes. Any approach to funding should encourage provision of health interventions that redress inequalities in health status that exist across different population groups.

- It should provide a predictable and fair approach to ensure stakeholder

participation.

5.2 Practicability

Funding strategies cannot achieve their objectives if they cannot be implemented within the constraints of the real world. They must take into account the practicalities of the political and administrative environments. A funding strategy should be implementable, and to be so it must possess certain characteristics.

- It should be easily understood, thereby increasing its public acceptability.

- It should provide the ability to predict change in requirements for hospital funding related to demographic changes, change in morbidity, change in the availability of effective medical interventions, etc.

- It should promote commitment to a level of hospital service delivery that will enhance long term survival of public financing for hospital care.

- It should permit flexibility so as not to preclude emergent promising approaches to funding the health care system.

- It should be supported by necessary informational requirements.

- It should be feasible from an administrative point of view.

It should be noted that there is an inherent conflict between some of these criteria. Improving on one may often involve worsening of another. For

example, improvements in equity may be achieved by improving delivery of effective services to groups that are traditionally underserved by the health care system. However, resultant improvements in equity of health outcomes may occur at the expense of systemic efficiency. In this report, we have explicitly placed a major emphasis on the criterion of effectiveness because of the centrality of this feature in meeting the most fundamental goal of the health care system - improving health status. While consideration has been given to the remaining criteria, less emphasis has been placed on them.

6. APPROACHES TO FUNDING HOSPITALS AND THE HOSPITAL SECTOR

6.1 Overview

"Hospital funding" has many implicit meanings. The most common of these refers simply to the method by which individual hospitals are paid to enable them to provide health care interventions. Two funding mechanisms of this sort will be reviewed in section 6.2. Global funding refers to our current system of funding in which block grants are provided to individual hospitals so that they may operate programs. Case payment refers to a funding formula recently introduced in the United States, in which hospitals are paid for the activities (defined as cases treated) that they produce.

A second meaning of the term hospital funding refers to the funding of hospitals within the health care system and more specifically, to the process through which decisions are made about the level of funding that hospitals receive in relation to other sectors of the health care system. Currently there is nothing in place that makes this process explicit. Several approaches to health care system organization and funding have been developed which attempt to deal with the role of hospitals within the total system. Strictly speaking, these are not hospital funding mechanisms. Their scope is much broader - at some level, they each address the issue of the volume and mix of hospital services to be provided within the range of health care services. Each of them views the health care spectrum from a different perspective, and in doing so provides a focus on different aspects of the problems identified above.

The first system wide funding mechanism is managed care capitation, a strategy that ensures provision of preventive, ambulatory and inpatient care

for a fixed fee per individual. The second is geographically based capitation, which assigns a fixed per capita dollar allocation to each individual in a geographically defined area. A third, and newly defined approach, is the health care envelope system. It is a process whereby all services devoted to a particular health care problem or area (such as cancer) are delineated and placed in a single pool or envelope for assessment. Consideration is given to funding services on the basis of their relative cost-effectiveness. In that way, explicit budgetary reallocations from one health care sector to another can be effected on the basis of cost-effectiveness criteria. These three approaches to systemic funding are reviewed in section 6.3.

6.2 APPROACHES TO FUNDING HOSPITALS

6.1.2 Global Funding

Global funding refers to a mechanism which provides block grants to individual hospitals to enable them to operate approved programs in a given year. The system is prospective, but reflects historical costs. Adjustments are made annually to recognize rising costs due to increases in the prices of inputs. Occasionally adjustments are made to reflect changes in the mix and volume of inputs, and to allow for the introduction of new programs. Any of the latter adjustments subsequently become part of a base budget to which percentage increases apply in future years.

Performance of Global Funding in Relation to the Criteria

The main strength of global funding has been its ability to constrain expenditures. Global approaches have been credited with enabling Canada's hospital sector to achieve higher levels of technical efficiency than its

counterpart in the United States. Canadian research has shown that global funding has contained growth of volume and mix of inputs into the system: most of the increase in the costs to produce a given activity have been attributed to increases in price rather than to change in quantity of inputs. In Canada, in contrast to the United States, measures of inputs per patient day and inputs per admission have risen very slowly.

There has been a tendency, however, for average length of stay (which is sometimes used as an indicator of technical efficiency) to increase under a globally funded strategy. Canada is the only country in the Organization for Economic Development and Cooperation (OECD) which has a pattern of increasing average length of stay. Global funding may not be responsible: fixed budgets in the United Kingdom have been associated with decreasing length of stay. Furthermore, closer examination of the Canadian pattern reveals that while length of stay for short term admissions (those less than 60 days) has been decreasing over time, greater numbers of long term admissions (over 60 days) have been the factor responsible for overall increases in length of stay. Nevertheless, some have argued that global funding contains no incentives to reduce length of stay, and may actually encourage the relatively low cost later days of a long term stay.

Theoretically, global funding should provide good levers for controlling expansion of programs and services for which there is no evidence of effectiveness. While there are indications that this has occurred on some small scale in Canada relative to the United States, the process has been far from explicit. Since new programs are funded separately, over the longer term they represent a means of increasing the base budget. Thus, global funding has had the effect of encouraging entrepreneurial championing of new activities. For the most part, the system has reacted to such pressures by funding activities in high demand for which there may be no evidence of effectiveness.

There is a public perception that the constraints on inputs imposed by global budgeting have squeezed the system in a manner that jeopardizes the health of the population. The limited emerging evidence on outcomes, however, suggests that the effectiveness of hospital-based activities and the consequent health of the population in jurisdictions with global budgeting is as least as good as that in jurisdictions where there is no such control. For example, outcomes of surgical care in Manitoba compare favourably to those in New England, despite estimated costs in New England which are fifty percent higher. Thus, while global funding strategies have controlled costs and inputs relative to the United States, effectiveness appears not to have been reduced. Relative to cost-based U.S. approaches, global funding appears to promote higher overall cost-effectiveness of the hospital sector.

Global funding operates primarily at the level of inputs to the hospital system. In theory, the limitation of resources forces health care providers to make choices and limit activities. But those choices are not based on a comprehensive analysis of the relative health effects of the activities. Instead they are made largely on the basis of demand - from physicians who believe that to provide medical care, they require a continually increasing volume and complexity of institutional activities, and from the public who for the most part, follow the lead of the physicians and the popular press. Since global funding does nothing to limit this demand it has generated intense and continuing public debate with rhetorical references to underfunding, shortages and excessively long waiting lists. Since outcomes and health effects play no part in the process, they have not entered the vocabulary of the physicians, press, or public. Thus, there is no basis for a critical analysis of whether the level of demands is appropriate and there are no explicit incentives to selectively fund activities that show higher relative effectiveness. Rather, ineffective activities for which there is high demand are just as likely to be funded as highly demanded effective activities. Since hospital funding is considered in relative isolation from the other sectors of the health care

system, there is neither the means nor incentive to reallocate in order to achieve systemic efficiency at the level of the health care system as a whole.

On the more positive side, global funding has been able to address the issue of equity of access to hospital services (a different issue from that of the equity of health outcomes). Since funding is on a per hospital basis and new programs are identified separately, the global system provides a framework to fund hospital activities in areas that are traditionally underserved by the medical system. But without outcome data it is impossible to know whether this has been done effectively.

One of the great strengths of a global funding approach, from the perspective of the Ministry of Health, is its practicability. Global funding, while involving intricate estimates and negotiations, is easily understood by institutions, the public and government: on the surface, it has appeal because of its simplicity. Furthermore, it has provided the government with some ability to track and estimate the magnitude of its expenditures on the institutional sector. Because of its macro focus, global funding requires a minimum of administrative resources. Administrative costs in Canada have been demonstrated to be very low in comparison to the United States. However, there is a cost associated with this focus - the absence of micro information which facilitates more effective management at the level of the hospital, the hospital sector, and the health care system. Arguably, global budgeting has hindered development of sophisticated information systems that provide consistent and timely financial, statistical, and clinical data.

Some of the most severe criticisms of global funding in Canada come from the individual institutions. They complain that current budgets are too rigidly based on historical experience. Because historical spending and funding patterns reflect a host of special circumstances which may have changed over time, hospitals that are now of similar size and have similar

case-mix are likely to have markedly different base budgets that do not reflect the current set of activities that they provide. As evidence, such hospitals usually cite the wide variation in funding levels between institutions with similar roles and volumes. A mechanism to facilitate explicit comparisons among hospitals might generate information to redress some of those imbalances.

In summary, the global funding system has served Manitoba well in controlling inputs, especially as regards intensity of activities. It has provided some measure of cost control not possible with previous line by line approaches. Furthermore, recent studies indicate that it has provided Canada with the ability to achieve greater cost-effectiveness relative to the United States.

And yet some of the real potential to reduce costs for provision of effective services within a global funding framework remains unrealized. An explicit emphasis on improving effectiveness and technical efficiency might increase this potential. For example, to improve effectiveness, it would be useful to require the demonstration of effectiveness before funding new programs and to withdraw funding for services that have been demonstrated not to be effective. To improve technical efficiency, it may be possible to develop management processes that will lead to reduction of duplications in servicing. For instance, for relevant groups of hospitals (e.g. urban hospitals, regional areas), it may be possible to introduce approaches which allow for joint Ministry and cross-hospital consultation to plan hospital roles, programs and activities more explicitly. Comparisons of available programs and activities might lead to the identification of duplication and inefficiencies. A process that seeks and uses comparative data on a pooled and participative basis is likely to provide very different possibilities for improving technical efficiency than the one currently used for global funding which relies solely on hospital by hospital submission.

6.2.2 Case Payment

Funding based on case payment represents a major conceptual shift from a global system. Case payment is used in this paper to describe an approach that focuses on paying for discrete sets of hospital activities, defined as admissions to hospital for specific diagnoses (cases). The prototype for this approach is the Diagnostic Related Group (DRG) payment mechanism, implemented for the Medicare program in the United States. Recently two Canadian provinces, Alberta and Ontario, have begun to introduce case funding overlays to their global funding systems in an attempt to derive some of the benefits of this approach while maintaining some of the strengths of the global system.

The central features of a pure case payment funding strategy will be described using the DRG payment system as an example. Central to this approach is a classification scheme that groups inpatient hospital activities into over 400 distinct categories of diagnostically related hospital admissions according to their consumption of resources (inputs). In the DRG funding approach, the logical product of the hospital is an episode of hospital care or a hospital admission. This model is similar to the one outlined earlier in this document in Figure 2: the admission, categorized by primary diagnosis, provides the unit for defining, measuring and funding the set of inpatient activities produced by a particular hospital. (This model, it should be noted, does not make reference to effectiveness. From the outcomes perspective represented in Figure 3, admissions represent only intermediate activities.)

The DRG classification system provides an accurate and reliable method of defining and measuring specific intermediate products of hospitals. This, in turn, makes it possible to shift the focus of hospital funding formulae away from inputs and towards the funding of activities. By focusing on activities, it is argued, incentives for efficiency (technical efficiency in

our framework) are produced. Since a fixed amount is received for each DRG case, hospitals can identify which DRGs they produce at higher than average cost. Because they may keep any consequent savings, they then have both the information and the incentive to move towards technical efficiency in the delivery of each DRG. In this way the use of prospective case payment for hospitals is designed to provide incentives for hospitals to monitor their costs of providing care and to adjust behaviour accordingly.

To reimburse hospitals, one first needs an acceptable classification system for cases. An ideal system would have a limited number of clinically meaningful categories. Secondly, the cost variations within each category would be narrow enough to permit determination of an accurate price. While no ideal system has been developed, the most widely used system is the DRG system. The 400 plus case types for DRGs were defined using patient, clinical and resource considerations. The final categorization scheme uses: 1) patient variables such as age, sex, and birthweight for neonates; 2) diagnostic information; and 3) procedures performed. The basic features of the DRG system have been used to develop a Canadian system called Case Mix Groups (CMGs) which defines 471 different categories. Case mix categorization systems continue to change and be refined. More recently, a refined DRG classification scheme has been developed in the United States. It provides meaningful groupings for case mix as well as severity but has the disadvantage of containing over 1000 different categories.

Once the specific categories of hospital cases have been defined, appropriate payment rates for each of the specific case products (DRGs) must be established. In other words, one must determine some baseline cost for different types of admission (e.g. appendectomy, tubal ligation, craniotomy, etc.). This is usually done by determining average or median costs to produce a given type of case. From the cost figures, it is possible to develop an index that describes the resource use for a particular DRG in relation to a

DRG chosen as a standard: a resource intensity weighting factor. For instance, an admission for a craniotomy (brain surgery) has much higher resource requirements than an admission for an appendectomy. Average costs are calculated across many hospitals to determine an average price per DRG. In the DRG system reimbursement is based on the average cost for each DRG times a 'standardized' cost per discharge at each hospital. The standardization process can adjust for differences in local wages, teaching intensity, remoteness and other factors. Under such a payment system, DRG-specific payments for some hospitals will be less than their average cost, while for others they will be higher. This reimbursement mechanism therefore contains incentives to reward efficient hospitals, penalize those that are less efficient, and thereby to provide incentives to increase efficiency.

In Ontario and Alberta, case payment methods are being used to determine both the number of weighted cases (a measure of hospital activity) and average costs per weighted case (a measure of technical efficiency) to compare the production and efficiency of inpatient care in different hospitals. These comparisons may provide some insight that will allow funders to determine which hospitals appear to be overfunded and which appear to be underfunded for the inpatient care they are providing. This information is being used to guide marginal funding shifts in global budgets among hospitals.

Performance of Case Payment Funding in Relation to the Criteria

By funding activities, case payment provides the hospital with an incentive to assess inputs in relation to activities. Theoretically, this should promote technical efficiency. Case payment strategies contain no incentives to encourage the selective production and delivery of effective services - equal funding is given to both effective and ineffective activities. Case payment approaches actually create large incentives for hospitalization - hospitals are paid directly for the volume and complexity of

admissions that they produce. Hospitals may increase their production by shortening length of stay to free up additional beds, by encouraging admissions to increase revenue, etc. Because there are no incentives to encourage admissions selectively for more effective care, a case payment system is likely to encourage provision of less effective services.

In the United States, there has been a rapid rise in the volume of general procedures and surgical procedures since the introduction of the DRG payment system. Specific to this issue, Bunker and Schaffarzick indicate that DRG payment systems contain incentives for the hospital to encourage surgical interventions. Ambulatory visits have increased because of inherent incentives to realize cost savings by shifting from inpatient to outpatient modes of services delivery. As a result, ambulatory care costs have increased sharply, blunting potential savings. There has also been a tendency for institutions to reclassify cases to higher cost DRGs (DRG creep) as a means of increasing their revenues. In addition, there may be incentives to shift care to other settings such as long term care and community settings to free up beds for more 'cases' so that more revenue can be generated. Because cost savings from shorter lengths of stay accrue to the hospitals, there are incentives to decrease lengths of stay. Some of these may be associated with the release of patients who require higher levels of support than previously required - they are at risk of being discharged sicker and quicker. Without attention to effectiveness, a case payment system, while addressing technical efficiency, contains an inherent danger of raising demand while actually decreasing effectiveness and overall system efficiency. Case payment mechanisms *per se* therefore contain incentives only for technical efficiency. They do not address the central issues of effectiveness or systemic efficiency and in fact may aggravate existing problems.

Case payment can be used as an overlay to global funding strategies as a potential means of improving technical efficiency by providing information

about the relative use of inputs for production of a standard activity (average cost per weighted case). This, in turn, may encourage hospitals to examine and improve their own patterns of technical efficiency. However, because case payment overlays contain incentives to reward increased production of activities regardless of effectiveness, they contain inherent risks of stimulating growth in volume of ineffective activity.

In terms of practicability, case payment mechanisms contain intuitive appeal. From the perspective of hospitals, the public and the government, it makes sense to pay hospitals for the activities that they produce. Furthermore, since there is a relationship between population characteristics, morbidity and expected patterns of DRGs it is possible to make some predictions of changing requirements for hospital funding that may be related to these factors. A case payment overlay to global funding, however, is much more complicated to understand and would require much greater administrative resources to manage than a simple global funding approach.

Another problem with the feasibility of implementing case payment as a primary strategy for funding hospitals in Canada is the unavailability of relevant Canadian data on inputs that can be used in the development of appropriate payment rates per DRG/CMG. Resource Intensity Weights (RIWs) have been developed by the Health Management Records Institute (HMRI) to measure the relative costs of CMGs. They have been criticized because they were developed using a combination of cost data from New York and length of stay data from Ontario. Their applicability to Canadian hospital practice has been questioned. Another feasibility problem relates to the fact that case payment mechanisms have been developed for just one component of hospital services - inpatient care. The range of hospital activities is much broader than this, including activities such as ambulatory care and long term care. While case mix and costing methods are being developed for these types of activities, they are not yet available.

Because case mix payment approaches provide a useful method for classifying and comparing hospital activities, they also provide a framework for providing information on effectiveness by permitting the linkage of outcome information to specific DRG/CMG groups. Crude indicators of outcome such as mortality, readmission, and sequelae for particular DRGs/CMGs can be developed. Crude indicators of cost could be provided by resource intensity weights, length of stay and hospital-specific operating cost per weighted case (for inpatient care). Availability of both input and outcome information specific to DRGs/CMGs would facilitate the development of indicators of cost-effectiveness adjusted for case mix for various types of inpatient care. In the presence of a larger strategy to force a shift in focus to outcomes, the case classification system can provide a taxonomy which will facilitate the measurement of outcomes, effectiveness and cost-effectiveness.

As a primary funding strategy, the case payment approach has some major problems. As a management overlay to a global funding approach, it may provide some incentives for technical efficiency, but it contains the inherent risk of rewarding hospitals for production of ineffective activities. The experience of Alberta and Ontario should be monitored to evaluate the usefulness of this approach. The greatest strength of the case payment approach is the case classification method which forms the basis of the strategy. It provides a platform that allows definition of hospitals' intermediate products (activities) so that input and outcomes information may be assessed, while controlling for case mix (and potentially severity). Within a funding environment that focuses on effectiveness, it provides a tool that can provide useful information about technical efficiency, effectiveness and cost-effectiveness of inpatient hospital activities.

6.2.3 Summary

Global funding and case payment represent two distinct approaches to funding hospitals. Global funding is the most familiar and has been comparatively successful in gaining public and administrative acceptance and constraining overall expenditures. It has controlled expenditures largely by encouraging hospitals to limit inputs used in the production of given activities. It is relatively inexpensive to administer and reasonably predictable and stable. Its main shortcomings are its failure to moderate demand, to cope with the effectiveness issues, to provide incentives for data systems which record outcomes and cost data in useful formats, and to deal with the full health care spectrum. There remains considerable potential to incorporate an effectiveness perspective into a global strategy to move the system toward greater provision of effective and cost-effective forms of care. This can be done both by providing stronger management from within the global system and by introducing selective aspects of other funding strategies as management tools to guide hospital funding decisions.

Case payment has been successful in placing hospital activities into meaningful categories (DRGs/CMGs). This has allowed for a focus on technical efficiency on a diagnosis related basis and has facilitated cross-hospital comparisons. It does not, however, contain any means for dealing with either demand or effectiveness. Indeed, it contains elements which increase demand. Nevertheless, its case mix classification system might furnish the platform for a preliminary gathering of useful cost, outcome and effectiveness indicators.

6.3 APPROACHES TO HOSPITAL FUNDING WITHIN THE HEALTH CARE SYSTEM

6.3.1 Managed Care Capitation

Managed care capitation refers to a strategy for funding and organizing medical care that links the provision of preventive, ambulatory and inpatient activities into one organizational unit. It requires that patients enrol in an organization that provides comprehensive health interventions and contract to receive their total set of health care services through this organization. In return for a per capita annual payment that reflects an average cost of producing and delivering comprehensive care per individual, the managed care organization undertakes the delivery of a complete set of services in accordance with the patients' needs. Since funds are limited and the organization bears the full cost of a patient's care, incentives are produced for the managed care organization to provide the most technically efficient services by encouraging the substitution of less expensive forms of care for more expensive ones. It has been argued that incentives also exist for the managed care organization to provide the most effective services for a given level of funding, thereby increasing effectiveness and cost-effectiveness of the set of services produced and delivered. For example, example, by focusing on the timely delivery of effective services, such organizations could reduce the likelihood of incurring costs of treating health problems that could become more costly at a later point in time.

The prototype for this organizational model is the health maintenance organization (HMO) in the United States and the health service organization (HSO) in Canada. Strictly speaking, managed care capitation is not a model for funding hospitals, because these organizational structures (and consequently their funding mechanisms) encompass hospital care within a more comprehensive set of services. But because they have been demonstrated to incur markedly lower patterns of hospital utilization, they have been

considered as options for the restructuring of hospital funding. American experience suggests that the most significant source of cost savings in managed care is attributable to the integration of ambulatory and hospital care. Increased control over hospital utilization, coupled with the financial incentive to reduce it consistently produce significant decreases in utilization.

Performance of Managed Care Capitation in Relation to the Criteria

Managed care capitation assigns control over the decision to hospitalize patients to the provider employed by the organization (the HMO). The incentives of the HMO are to reduce use of expensive inpatient care - these incentives are transferred to physicians when they have a direct stake in the resultant savings. If beds are closed as a result of the reduced demand, money is saved and care is more efficient. To the extent that decisions to hospitalize are based on evidence of improved outcomes, this model provides incentives that encourage the production and delivery of effective hospital services. However, hospitalization patterns are likely to be influenced as well by patient demand and by expected patterns of hospitalization based on established patterns of care. Moreover, some have argued that the model contains incentives for underservicing which may have a detrimental impact on health outcomes. Because the funding strategy does not require explicit consideration of outcomes, incentives for effective care are only operative in an indirect fashion in the managed care capitation model. A controlled trial in which individuals were randomized to either a fee for service or a health maintenance organization provides indirect evidence of effectiveness of this model for the nonpoor. These individuals had equivalent or better health outcomes in the HMO setting for lower cost. Poor individuals, in contrast to nonpoor, had worse health outcomes in the HMO setting than they did in the fee for service setting. Thus, in terms of equity, managed care models have been

demonstrated to have shortcomings in terms of their differential health outcomes for the poor.

The evidence is strong that managed care models introduce major incentives for the improvement of technical efficiency - the production and delivery of a given set of activities with a minimum of inputs - by preferentially encouraging the provision of service in the ambulatory sector instead of the hospital sector. Theoretically, this model introduces incentives that promote systemic efficiency of the health care system as a whole, at the level of the hospital sector, and at the level of the individual hospital. However, this is gained only to the extent that there are real incentives to provide effective outcomes selectively. As discussed above, in the absence of reliable outcome data, this is not necessarily the case. In fact, one example (albeit uncontrolled) suggests that the application of managed care capitation on a population-wide basis will not necessarily lead to systemic efficiency: the cities of Minneapolis and St. Paul which have a very high proportion of their population enroled in HMOs do not have lower per capita costs for medical care than other areas of the United States.

Perhaps the greatest problems with the managed care capitation models relate to their feasibility within the Canadian context. While the concept of per capita payment for provision of a complete set of services is intuitive and easily understood, other problems make the introduction of this model operationally difficult. Most important are legislative constraints. The ability to create distinct managed care organizations that could enrol individuals and realize savings would require legislative change. The most significant change in legislation would be required to introduce the concept of 'locking' enrollees in so that they contract to receive all of their care from a particular organization or set of providers. The uniformity requirements in the Canada Health Act as well as the guarantee of choice of provider have been identified as major impediments to the introduction of this

model into Canada. Nonetheless, Ontario is moving forward with modified models that relax the 'locking in' requirement. Moreover, significant savings attributable to HMOs flow from reduced physician payment costs. 'House' physicians who are paid on a salary rather than on a fee-for-service basis by the HMO have no incentive to increase the volumes of patient visits and so do not generate additional fees and demands for subsequent services. A large scale implementation of an HMO model would have to involve some change in the way in which physicians are compensated. The extent to which the Canadian system could be shifted toward this model remains speculative. Even in the United States where there is supportive legislation and incentives for the population to enrol, the HMO model has only slowly penetrated the market. Moreover, in the United States variations in the way in which managed care is provided are appearing, and the organizational structure of the managed care approach is still evolving.

It should be noted, however, that there are increased administrative requirements for this type of system. There is a need for improved information systems, calculation of capitation rates that adjust for differences in health status for different populations and the refinement of payments to hospitals. An HMO in the United States may be cheaper administratively for an enrolled individual than is the alternative net of insurance, payment and monitoring requirements for the individual who insures privately. In Canada, however, a managed care system would represent another potentially costly level of administration.

In summary, while the managed care model is very attractive as a strategy to foster reduced reliance on high levels of hospital resources, some requirements of implementation make it difficult to operationalize in Canada. In addition, while the cost-effectiveness of this model in comparison to a fee-for-service based model in the United States appears to be transferable to Canada, the size of the savings may not be as great because the Canadian

system is already more cost-effective, and no test of managed care capitation has ever been carried out on a population wide basis.

6.3.2 Geographically Based Capitation

Geographic capitation refers to a funding process which assigns a fixed dollar allocation to each individual in a given region. The assigned value is assumed to be the average amount required to fund provision of health services for the individual over some designated time period (usually a year). Regions are then allotted an amount equal to the aggregate capitated amount for all of the people in the region (adjusted for need). Regional capitation models have been recommended for consideration by several different provinces; the approach is currently being implemented in Quebec. It requires that some regional authority be charged with responsibility for funding or purchasing health services for a defined population for a defined period of time. Specific funding decisions, and therefore accountability, are decentralized from the Ministry of Health to regional boards. When applied on a regional basis the equity criterion requires that the amount allocated per individual take into account those characteristics of the population which might affect their need for health care. Moreover, it must make provision for the mobility of individuals and their ability to seek treatment across regional boundaries. It is not clear how large urban areas (or tertiary care facilities) fit into a regional framework.

Applying a capitation system in Manitoba poses special problems, given the distribution of population and the utilization patterns of hospital care which uniformly cross regional boundaries into Winnipeg. Approximately one half of all hospital expenditures are accounted for by the Health Sciences Centre and St. Boniface Hospital, while about two-thirds are attributable to hospitals in Winnipeg. Currently, rural regions (non Winnipeg) have direct

control over only one third of provincial hospital expenditures. Any regional capitation system would have to make provisions for major transfers of funds across regional boundaries. Thus, while conceptually simple in theory, capitation poses problems in application which are far from easy to overcome.

Performance of Regional Capitation in Relation to the Criteria

Regional capitation does not necessarily hold out the promise of more effective delivery of health services based on health outcomes. Funding under such a system is posited on per capita allocations. Since increased funding is not tied in any direct way to health outcomes, health care providers do not have incentives to institute systems for monitoring outcomes. Without reliable information on outcomes, movement towards the delivery of more effective services cannot be expected. Nor are there mechanisms for detecting and discontinuing ineffective services. This does not mean that a health outcomes perspective could not be introduced, but there are no explicit incentives to do so in this approach.

A close look at the arguments for regional capitation shows them to be similar to those for managed care capitation. Like HMOs, regional authorities would have responsibility for the total health needs of a fixed population of individuals on a fixed fee basis - the hope would be that they would have incentives to be both efficient and effective. In an HMO, the incentive to be efficient follows from the organization's ability to capture any savings realized in the care of its population. The effectiveness incentive is more tenuous, and relates to their reputation for effective care that might be imperfectly communicated to potential future clients.

It would be very difficult, if not impossible, to capture that incentive structure on a regional basis in Manitoba. To replicate the incentives, funding on a per capita basis for hospital care would have to be integrated

with funding for all other health care interventions, including physicians' services. That care would have to be provided on other than an open ended fee-for-service basis. Given the prevailing climate, that is not a foreseeable possibility. Physicians would almost certainly view it as a means of capping their incomes and limiting their discretion. In the absence of such integrative funding, there would be no built-in incentive to provide care via the most effective component of the system. Indeed, if different sectors were funded separately, each might have an incentive to pass on high cost patients to another sector. Thus there would be no inherent incentive to provide the most effective treatment on a system-wide basis.

One of the surface features of regional capitation which makes it appear attractive is the implicit promise of the regional delivery of services in an integrated manner. However, as noted, a close look at the context of hospital care in Manitoba indicates that some of the conditions necessary for the efficient provision of services via a regional capitation system are absent. If per capita funds were allocated to regional authorities outside Winnipeg they would have to make the choice of either funding the local provision of any given service or purchasing it from a regional or Winnipeg facility. The non-urban regions would be much smaller than the Winnipeg region and smaller than most regions considered in other provinces. Given the high overhead costs of many specialized diagnostic and treatment procedures and the small size of many regions, it would be grossly inefficient for all regions to attempt to provide the full spectrum of care for residents of that region. Nevertheless, a regional authority in control of funds would have incentives to expand their services to provide local access, especially to acute care, which would likely dominate expenditures. Many of those services would undoubtedly be provided at higher cost, and would create additional inappropriate usage.

On the other hand, if smaller regions attempted to purchase specialized

diagnostic and treatment services for their population outside their region, they would likely have to purchase these services from secondary or tertiary centres in Winnipeg. Those centres would have no incentives to provide specialized services at low cost to the regions. It might be thought that the larger hospitals and other suppliers of care could compete for the provision of services and that efficiency gains might result. However, the lure of revenues from the sale of services would remove incentives for hospitals to specialize in specific procedures and high technology innovations. One might well imagine the inappropriate diffusion and use of technology spurred on by the promise of revenues from the regions. The result could well be oversupply and inefficiency. On the other hand, price competition might provide competing hospitals with incentives to provide more of their services to the regions on an outpatient basis, thereby reducing average costs. In both events, the purchase of services by rural regions would give vendors an incentive to begin tracking the costs associated with individual patients on a case-mix basis to make their pricing structure rational. This information, since it could be compared in the market on a competitive basis might furnish the basis for moves to the more efficient delivery of services. But the overall requirement of pricing and charging would certainly add a new administrative requirement to the process and result in additional costs. It is not at all clear what the net effect of all these factors would be. The additional regional services, the overhead costs of competition, and the accounting requirements might well overbalance any competitive gains. There might well be no gain in efficiency - and even a loss is possible. Furthermore, there are no explicit incentives in this funding approach for hospitals to begin collecting data on outcomes, and so a vital component needed for moving towards systemic efficiency would be absent.

An additional shortcoming of regional capitation is that it does not address the issue of demand for services. In the absence of a role for the effectiveness of procedures in the funding formula, information which might

moderate demand from both physicians and the public is not likely to become available.

A final difficulty with regional capitation is tied to the problem of applying the concept in Winnipeg, where roughly 60% of the population resides. Residents of the city have the option of seeking hospital care anywhere in the city. Although it may be possible to identify catchment areas for hospitals in the city (N. P. Roos, 1991), the models are still in their infancy, and for the near future are likely to be contentious as a basis for funding hospitals. Defining regional capitation within Winnipeg on a practicable basis may prove impossible in the medium term.

The strongest case for regional capitation is theoretical. It is based on the *prima facie* fairness of a funding scheme which provides support for individual care on an equal basis adjusted for need. This would appear to satisfy the equity criterion discussed above. Moreover, funding on a per capita basis is intuitive, easily understood and hence publicly acceptable. It also furnishes a mechanism for adjusting funding on the basis of population growth and changing demographic characteristics. However, since all residents of the Province already have the right to treatment in any facility, there would be no equity gain unless capitation on a regional basis were used to redress historical imbalances in funding across regions and were used to provide additional services in areas in which they were not previously available. This would require a careful analysis of the population characteristics of the various regions. The formula for assigning per capita costs for individuals in different areas would have to take into account different demographic, usage, mortality, morbidity and possibly other characteristics of the population and is therefore likely to be controversial.

A capitation approach may be more useful as an analytic tool for studying and monitoring expenditures in a region than as a funding formula *per*

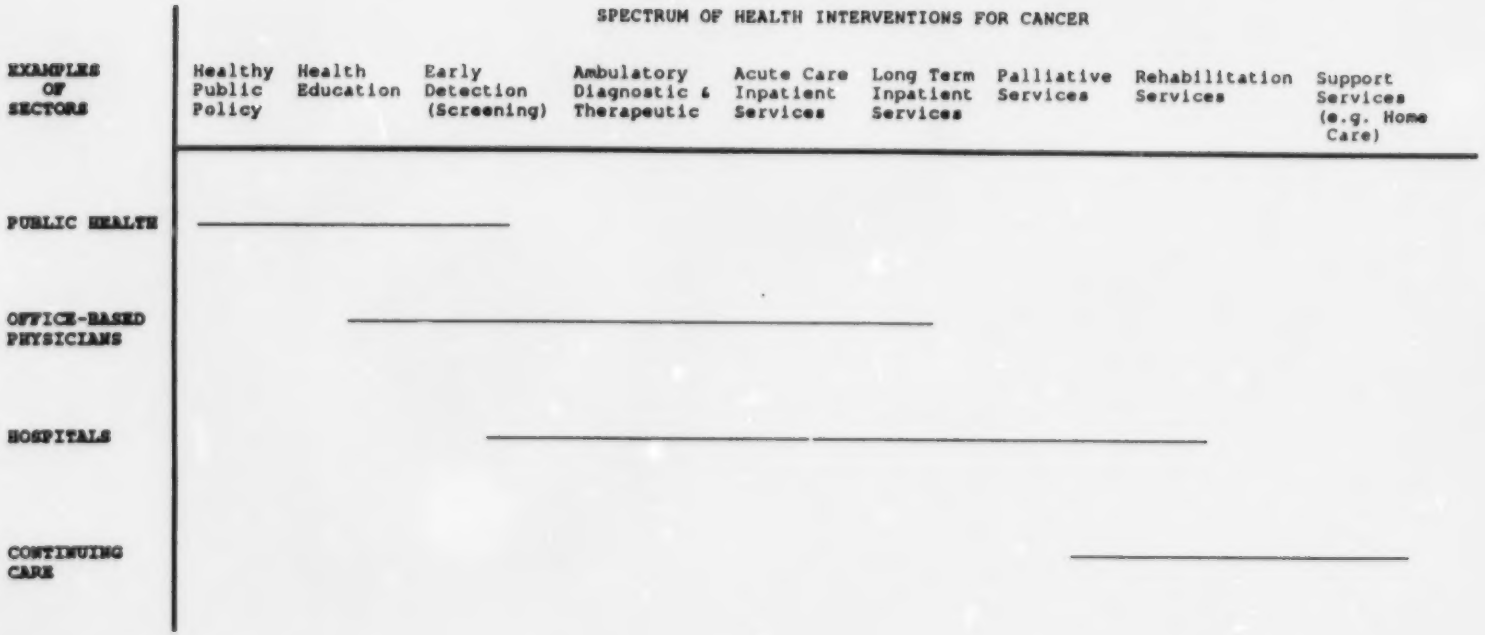
se. By providing comparative information on regional use of resources, it can provide direction to global funding. A look at relative per capita utilization and expenditures in different regions is likely to identify patterns of varying use of hospital services. These can then be adjusted within a global funding system via the use of specific devices such as bed closures. Comparative analyses of spending (like that in the recent Brandon General Hospital study) can have both a practical and educative role. The use and publication of capitated expenditures may be a useful way to inform both patients and physicians about anomalous usage patterns with the possible reduction in pressure for expansion. Thus, regional capitation may be useful as a supplementary perspective, but, given the characteristics of the Province, regional capitation is not seen as a practicable funding formula.

6.3.3 Health Care Envelopes

The envelope system has neither been implemented nor discussed in the literature. It represents an approach for making the process of allocating funds for health interventions more focused and explicit. In an envelope system, the primary areas for consideration would be specific broad areas of health care (such as cancer, or cardiovascular care). Funding via an envelope is posited on the notion that reallocating funds to more cost-effective interventions would be facilitated if all health care providers with responsibility for delivering interventions in a specific health care area (say cancer as in Figure 5) were funded from within a defined budget. Thus, for example, envelope funding for cancer would require the identification of all expenditures on cancer. The providers of such care, as a group, would be given a fixed budget (or envelope), and within that budget, be expected to recommend the most cost-effective volume and mix of interventions. By bringing together all providers of care, focusing on the interventions they furnish, and explicitly calling for estimates of the cost-effectiveness of

FIGURE 5

ROLES OF VARIOUS SECTORS WITHIN A CANCER ENVELOPE



those interventions, this strategy creates incentives for health care providers to place more emphasis on effectiveness. It also facilitates the transfer of funds from one sector of the health care system to another. Both of these would help to move the system in the direction of systemic efficiency. Thus, an envelope approach offers some advantages over other approaches to funding the hospital sector within the health care system.

Defining an Envelope System

An envelope system for funding health care is simple to conceptualize in theory. Expenditures on health care in all sectors need to be arranged into mutually exclusive and exhaustive categories that are clinically meaningful. An example of a categorization into health care areas might be: cancer, cardiovascular system, obstetrical/gynaecological/neonatal, respiratory system, mental health, digestive system, trauma, and 'other'. For each of these health care areas, the total set of services each health care sector provides and the cost-effectiveness of these different service modalities would have to be considered. Capping of expenditures for a given health care area such as cancer would produce incentives to shift service delivery to more cost-effective modalities.

To establish an envelope system, a mechanism for receiving input from all providers in a given health care area would have to be established. Representatives from hospitals, clinics, public health agencies, private organizations etc. would have to be convened to discuss the question of funding in that area. A baseline expenditure level would have to be established in consultation with the government and a target expenditure level for the coming time period determined. Discussions and consultations would then be undertaken regarding the most effective means of allocating the targeted funds to providers in the envelope. It is unlikely that the participants would be able to reach consensus on a division of the budget

among themselves, but the advice garnered from the consultations would be used by the government as a basis for incrementally shifting from less cost-effective to more cost-effective providers or sectors.

One could sketch how such a system might work to shift funding and provision of interventions 1) within particular institutions, 2) between institutions, and 3) from the hospital sector to other sectors by examining theoretical examples in an area such as cancer care. As an example of the first - if it were found that, for childhood leukaemia, less intensive treatment increased the quality life years of a child more than heroic interventions, funds might be targeted in that direction. As an example of shifts between institutions, if one hospital were shown to have a lower cost and higher (or the same) effectiveness than another hospital in treatment of leukaemia (in cases of equal severity) funds would be shifted to allow the former to provide the services. Finally, as an example of shifting from the hospital sector to other sectors, if cancer palliation were shown to be more cost-effectively provided in the community, funds might be shifted from hospitals to smaller scale centres. Shifts of funding based on considerations such as these would be carried out centrally after consultations with participants in the cancer envelope because it is unlikely that stakeholders will all agree on the approaches to be taken. Similar scenarios could be expected in an envelope for cardiovascular care and others.

Performance of an Envelope System in Relation to the Criteria

As noted above, the envelope system addresses a number of the deficiencies of the other funding strategies. Foremost among these is the provision of a mechanism for nesting the hospital sector within the overall health care system and providing a mechanism for comparing expenditures on hospital care with those in other sectors. The interchange that would be generated is likely to bring to the surface issues of the effectiveness and

cost-effectiveness of alternative preventive, diagnostic and treatment modalities. Moreover, the creation of an envelope system would place health care providers who deal in the same health care area in contact with one another. This would allow for a more direct comparison of the cost effectiveness of different services than is possible when hospitals as a whole act as the locus of the funding decision. Comparisons across all sectors might allow for reallocations towards more effective services with the attendant movement towards systemic efficiency.

A similar effect might be expected within the hospital sector. When a given hospital is faced with the issue of comparing its costs of providing services within a particular health care area with the costs faced by other hospitals, the reality of differentials in efficiency may be brought to bear. While such a comparison could be carried out under block funding, a hospital which believes itself to be cost-effective in a given area does not have the incentives to carry out the analysis to demonstrate that fact. It is not viewed as legitimate for a more efficient or effective hospital to make claims on funds currently allocated to another less cost-effective hospital. Under an envelope system the possibility of movement towards more specialization of services on the basis of comparative advantage would be enhanced by the direct comparisons of cost.

Similarly, if a hospital were able to claim a certain amount of funding for the provision of specific types of services, it would have incentives to provide these in the most efficient manner possible - for instance, by providing more services on an outpatient basis. Failure to do so might put hospitals at risk of losing funding in the future. This would reduce the average costs of services and, if there were no excessive increases in volume, net savings could be expected.

To the extent that different providers were forced to compete for

funding on the basis of efficient and effective performance, they would have the incentives both to improve performance and to document that improvement. But this would not be easy to operationalize. One would require data both on the costs of services and on their outcomes. In the early stages, the data available and the analysis which it would support are not likely to be extremely sophisticated. Indeed, the implementation of any system should make explicit demands on the health care providers to report, on an annual basis, not only costs, but also effectiveness indicators based on the outcomes achieved for the individuals who have received services. It might even be necessary to build in requirements that each sector report health outcomes of patients. The impact on interventions on their health might be tracked for a number of subsequent years. Indeed, a requirement of this sort is generic to any attempt to move in the direction of more cost-effective service delivery. What distinguishes the envelope system is its ability to focus the effort on an area by area basis across the entire health care spectrum.

It might not be either necessary or desirable to mandate a particular format for the reporting of outcomes and the effectiveness of services in the initial phases of an implementation process. Leaving latitude to the various actors would allow them to take a proactive role, relieve them of a narrow reporting requirement, and possibly generate useful initiatives. Initial attempts to document outcomes would have to rely on broad crude data such as age- and sex-adjusted mortality, morbidity, and sequelae of particular interventions. Estimates of resource use would have to be based on activity indices such as lengths of stay, paid patient days, etc. rather than on actual costs. As the system evolved, it would likely be necessary to bring some standardization to the reporting. Although there are some merits to giving providers latitude in their reporting formats, there are real dangers in doing so. Different institutions would be likely to produce irreconcilable statistics. The information might be of such poor and unreliable quality that decisions based upon it would be subject to major disputes. But these are

risks that cannot be avoided in the implementation stages of any strategy which hopes to make decisions on a cost-effectiveness basis.

Much of the basis for generating outcome and effectiveness data resides within the MHSC claims data base. Hospitals would, however, have to introduce additional record keeping on costs and other providers, such as Home Care etc. would almost certainly have to increase their data capture on a number of factors, as well as link themselves to the MHSC data base. In the early stages, MHSC might be able to play a facilitative role in providing data on outcomes and cost indicators. But the cost and tension likely to be generated by such data gathering and data analysis requirements should not be underestimated. They could be quite significant and pose substantial problems for the medium term. Nevertheless, the incentive and directive to report on outcomes could provide a start for the compilation of data in useful form. Since the absence of such data is one of the main impediments to efficient reallocation and the ultimate damping of inappropriate demand, this would be a major gain from an envelope system.

By drawing attention to cost-effectiveness measures and efficiency issues, an envelope system should permit movement towards fairer funding of comparable services across hospitals. On the other hand, where comparative advantages make it more efficient to discontinue services in some localities and concentrate them in others, there could be a concomitant loss in equity regarding regional and local provision of services. But it should be noted that the tension between equity and efficiency criteria is an inherent one which cannot be resolved by any funding formula. Patients with a given condition may have an entitlement to a relatively costly procedure that is only 40% effective if that is the only intervention that medical science can offer. Even if the same money applied to other patients with different conditions in different envelopes were to yield a 5% gain in effectiveness for 10 patients it might not be desirable to leave the first patient untreated.

That is a limitation of cost-effectiveness analysis. The values of the policy maker must determine what tradeoff in efficiency is acceptable in order to maintain certain levels of equity. Making the size of the tradeoff apparent and explicit is the best that any funding mechanism can achieve. A recent example of these difficulties is provided by the State of Oregon, which has moved towards the use of an explicit approach to priorize the entire set of services covered by its Medicaid program. This approach has been criticized because it seems to favour minor treatments over lifesaving ones. The perceived problem of relying on a formula has led to widespread criticism of this approach. This reaction underlines the need for a solid data base, the dissemination of important concepts into the public's consciousness, and a measure of flexibility to deal with hard cases.

The envelope system would shift the emphasis in funding away from the institution as a whole to the particular components of institutions that provide services in a given health care area. As such, it removes constraints on the amount of funding for a given institution and hence on the overall size and activity levels of any given institution. If some institutions prove to be more successful in obtaining funding for their activities, their growth might place them in monopolistic position as the provider of certain services. There might be short run gains but there is also a long run possibility that this could erode the basis for future competition and lead to increased costs.

One advantage of the envelope system is its intuitive appeal. The public is likely to be able to understand and relate to funding on a health care area basis. However, there is a major risk to the explicit definition of health care areas and delineation of resources devoted to each. Creation of separate envelopes for health care areas would allow for clear comparisons of the resources allocated to the areas. It is likely that interest groups would align with specific health care areas (to a greater extent than they currently do with particular institutions). Currently, no comparisons are available of

the relative expenditures in different envelopes and so there is no firm basis for considering reallocations across envelopes. The explicit identification of the funding level for an envelope will give interest groups in that area a focus for rallying support for funding. They can be expected to exert political pressure on funders to maintain and expand particular areas. This could constitute a major new source of political pressure and demand on the system. It would also limit the flexibility of funders to transfer resources across envelopes. A mechanism would be required to address this issue.

In spite of its intuitive appeal, there are significant problems that preclude the use of an envelope strategy as a funding tool in the medium term. The most important of these is the unavailability of good information about expenditures, and specifically hospital expenditures, within defined health care envelopes. Because of this, the introduction of envelopes as a funding strategy at this time would require reliance on a great deal of arbitrary decision making. This would be likely to lead to a loss of stakeholder support for the process.

Many of the problems of an envelope system relate to issues of implementation. To the extent that services required in a health care area are a function of population characteristics, it should be possible to anticipate increasing requirements in some areas as demographics and other population characteristics change. However, it will be necessary to identify and use appropriate data. Current knowledge is limited regarding the resources expended within different health service areas. While rough estimates are possible, firm estimates (especially on a hospital by hospital basis) are likely to be difficult to agree upon if they are to be used as a basis for funding decisions. Firm and reliable estimates, even of costs, are going to require the establishment of additional record keeping and analysis on the part of institutions. Attempting to relate activities to health outcomes on an envelope by envelope basis will also require additional data

capabilities. Moreover, where patients have multiple conditions, decision rules will have to be established to assign allocation to a particular envelope. All of these requirements will involve additional overhead costs for the system.

Special attention would have to be paid to the role of the aged in an envelope system. Categorizing expenditures by health area would tend to draw attention away from the central role the aged play in the health care system. Consideration of their problems might become fragmented in the funding process. Care would have to be taken to insure that this does not have adverse effects on the efficiency or effectiveness of care delivery to that population.

If envelope funding were to be comprehensive, total dollars spent on physician fees should be included within the envelope system. How to deal with that problem is a major issue in itself. It is outside the scope of this study, but it would have to be addressed, given the well known relationship between physician activities and hospital costs.

Realistically, an envelope system of funding is sufficiently different in kind, and some of the risks are sufficiently great, that it might be most prudent to first implement a pilot as a management tool to the existing global system. An initial pilot could be conducted in one or two health care areas as a basis for gaining insight into the real additional costs and benefits and getting a sense of the difficulty of reporting meaningful outcome measures. When considered as a management tool instead of a funding strategy, an envelope approach is likely to have less demanding information requirements and therefore to be more feasible. It would offer a useful perspective to guide decision making about the hospital funding process. However, even as a management tool, an envelope approach would require a significant commitment to the development of new information.

6.3.4 Summary

Each of the systemic approaches divides the resource pie and the activities towards which they are put in a different way, and each has a number of strengths and weaknesses. None is best according to all criteria; none is devoid of problems.

Managed care capitation has proven somewhat successful at controlling expenditures and demand for hospitalization in selected locations in the USA. It allows for some integration of care across a band of the health care spectrum wider than the hospital sector. It has not, however, demonstrated an ability to deal with effectiveness, and has never been applied over a total population. It is not clear that the incentive structure which generates its benefits can be captured in the Canadian context.

Geographically based capitation furnishes yet another grid for dividing and administering expenditures. Its main strength is its promise of more equity of service provision through local delivery and control. However, the distribution of the population in Manitoba makes it questionable that regional capitation would be feasible or would result in greater efficiency. Nor does regional capitation deal with demand or effectiveness issues. In addition, it might introduce incentives for the inefficient diffusion of services, along with significantly increased administrative overhead. In spite of problems with geographic capitation as a funding tool, analysis of utilization data using a regional capitation perspective has been shown to provide useful information to a global funding strategy.

An envelope system is the only approach which holds out promise of being able to address effectiveness and demand issues. It also offers the possibility of addressing funding across the entire spectrum of health care. In that sense it is different from the other approaches. But that advantage

comes at a price. The data base for implementing an envelope system does not currently exist and its development is likely to be a difficult and sensitive matter. Moreover, an envelope system runs the risk of focusing attention on specific health care areas and providing a focus for interest group activity.

Since none of the pure approaches is ideal, the challenge facing funders is to identify a funding regime which might incorporate the best features of several approaches without becoming overly complex and costly to apply.

7. CONCLUSIONS AND RECOMMENDATIONS

Hospital funding strategies have slowly evolved into their present form, moving from a focus on inputs to a focus on activities. To date, they have failed to give effectiveness an operative role in their formulations. As a result, they have been limited in their ability to achieve systemic efficiency. Rather, they have all emphasized the need to move towards more technically efficient delivery of services. Although some gains may yet be possible through increasing technical efficiency, this analysis has emphasized the need to take a broader view of the funding of hospitals and to emphasize effectiveness as a means of achieving better and more systemically efficient results. Since effectiveness can only be determined in terms of results, health outcomes must play a meaningful role in hospital funding. And only if results are known can inappropriate demand be moderated.

This will not be an easy task. One of the most important obstacles is the relative immaturity of these concepts. Only in recent years have they begun to appear with any regularity in the academic health services literature. They are only beginning to surface in clinical journals targeted at medical providers and they have certainly not made their way into the popular press or public consciousness. In order to rationalize funding systems, concepts of outcomes and effectiveness will have to be established as the backbone which supports all decision making. In order for this to happen, these terms must become part of the vocabulary of funders, policy makers, health care providers, the media and the public at large. Only when an understanding of these concepts is embedded in the culture of provision of medical care will hospital and health care funding be rationalized. The challenge is to bring this situation about.

Developing a language of outcomes will require major investments in developing meaningful indicators. It will then require the careful introduction of these indicators of effectiveness and efficiency into the decision-making process to provide some general direction for decision-makers. It will require the encouragement of relevant stakeholders to participate in the process and the refinement of the indicators. This represents a time and resource intensive process. It is a task that will be controversial and imperfect in its initial stages, but it is important that the first steps be taken. Manitoba is uniquely situated to be a leader in this area inasmuch as the claims data base can furnish a resource for the construction of outcome and hence effectiveness measures.

At the first stages crude indicators such as age- and sex-adjusted mortality and morbidity, adverse sequelae of procedures, and use of resources subsequent to hospital care may have to serve as proxies for more precise measures of hospital outcome. Indicators of activity costs such as length of stay, paid hours per patient day, etc. may have to serve as surrogates for direct cost data. Despite the limitations of measures such as these, some starting point is required. Acknowledgement of the need for a start, acceptance of the ultimate goal, and involvement of stakeholders at an appropriate stage should allow for the incremental refinement of hospital outcome and effectiveness measurements.

Global funding is an established formula which has brought a measure of stability to the system. To date it has been used primarily as a tool for controlling expenditure levels. It has not been used to manage the system - to reallocate resources either across hospitals or within hospitals. Several of the strategies reviewed in the paper could be used to strengthen and refine this process. Tools from case payment systems could be used to provide information about efficiency and, when combined with outcomes information, about effectiveness of specific institutions and the hospital sector.

Perspective gained from using per capita utilization analysis should be used as a management tool to guide funding decisions. The envelope funding perspective can be used to help redirect discussions about hospital funding towards outcomes and thus begin to address the issues of effectiveness and inappropriate demand.

The fundamental conclusion that flows from this analysis is that the global system should be maintained in the interim as the base for hospital funding, but that it should be redirected so that concepts of effectiveness play a more central role in funding decisions. Perspectives and tools from case payment, per capita and envelope approaches should be used to guide the decision making process. Specifically, it is recommended that:

- A major investment should be made in developing hospital data that will provide useful information on effectiveness and cost-effectiveness. Given the centrality of information about both costs and outcomes in any strategy to move to more cost-effective delivery of health care services, a number of specific initiatives are recommended:

    * A feasibility study should be conducted using Manitoba hospital data to test the utility of currently available case classification methods (including CMGs, DRGs, and refined DRGs) as a basis for assessing intermediate hospital products and providing useful information to global funding negotiations.

    * A pilot should be conducted, if possible, to determine the utility of case mix classification methods in conjunction with methods to estimate hospital costs as a basis for assessing the technical efficiency of inpatient care in Manitoba hospitals.

    * A feasibility study should be conducted using Manitoba

hospital data to test the utility of easily constructed indicators of outcomes in assessing the performance of hospitals. These might include case mix and severity adjusted mortality, readmissions, and other adverse sequelae.

  * The participation of health care providers should be sought in modifying indicators of case mix, technical efficiency and outcome that flow from the prior recommendations.

- Given some baseline of effectiveness and costing information, an envelope system should be piloted as a management tool.

- Regional per capita utilization should be used to provide information to inform global funding decisions.

Given the novelty of the concepts underlying the general approach discussed above, it may be necessary to introduce the concepts of effectiveness, cost-effectiveness and systemic efficiency into funding discussions via several initiatives that are not directly relevant to hospital funding processes. These initiatives should also have the effect of generating data that may be useful in the subsequent implementation of an effectiveness oriented strategy. They may also result in modifying the behaviour of some health care providers by furnishing them with relevant information. To these ends it is recommended that:

- Protocols to evaluate new interventions, procedures and technologies in terms of outcome should be developed and implemented.

- New interventions, procedures and technologies should be not be funded unless they are found to be effective and cost-effective in relation to

alternative approaches.

- The College of Physicians and Surgeons should be supported and encouraged to initiate work on the development of effective practice guidelines where evidence exists and to develop methods to monitor practice patterns. In particular:

  * A more comprehensive pattern of practice reporting format should be developed for newly licensed physicians, and should be mandatorily applied for the first five years of practice, on a pilot basis. Data should be gathered, aggregated, analyzed and distributed on indicators such as hospitalization rates, diagnostic test utilization, referrals, and outcomes. Feedback to individual physicians should allow them to evaluate their practice in relation to norms that may be generated from a representative sample of physicians in the Province.

  * The format of the physician practice profile should be revised and updated to make it more user friendly and to initiate introduction of indicators of outcome and effectiveness that are meaningful to clinicians (in light of the experience with the preceding recommendation). The College should encourage physicians to become familiar with their own patterns of practice in relation to their peers.

APPENDIX A

LITERATURE REVIEWED

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APPENDIX B

INDIVIDUALS INTERVIEWED

As per the terms of reference, discussions were conducted with individuals at the Manitoba Health Services Commission. The following persons were interviewed:

Mr. J. Robson, Director, Rural Health Facilities Division

Mr. S. Drain, Director, Urban Facilities Division

Ms. K. Thomson, Director, Long Term Care Programs Division

Mr. E. Golembioski, Chief Finance Officer, Urban Health Facilities Division

Mr. G. K. Neill, Director, Health Information Systems Division

Mr. J. Dale, Senior Manager, Integrated Health Systems

Ms. C. Montgomery, M.I.S. Project Manager

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